

## Pediatric Footwear: Podiatric & Parental Primer

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Those of us who specialize in podopediatrics are commonly faced with the challenge of treating not only by proper orthotic or brace control, but also finding the correct shoe to complement the care. The common goal with all pediatric foot orthoses is to help children gain mobility, ultimately giving them a better quality of life. Proper support gives a child the gift of running, jumping, and playing with confidence and stability. Providing the orthotic device is only half of the solution: proper shoe fit is equally important. Although finding the proper shoes for a child can be challenging, the benefits outweigh the challenges and inconveniences. All recommended measures should be taken to ensure that the child is safe and stable today, as well as protected from potential foot deformities in the future.

### **Identifying the problem**

When a child complains of pain, or abnormalities in gait are observed, steps should be taken to ensure correct treatment. Unfortunately, children might not verbalize symptoms, so it is important to watch for these biomechanical changes throughout their gait cycle. Often times, mild to moderate foot and ankle problems are ignored by primary caregivers until the child complains of pain. Parents and caregivers should also be aware of fatigue levels, stamina, speed, agility, and coordination when watching their children during physical activities. Understanding when to contact a podiatrist is important! “Growing pains,” may not be just that, and may be attributed to the biomechanical implications of the feet on the rest of the body. Sadly, if you take a poll of the millions of Americans with foot problems the magnitude of crippling foot deformities in the United States is concerning. It becomes obvious that most people do not “grow out” of their foot problems and those “growing pains” were actually a medical issue left untreated.

The most commonly ignored foot problem in children is the flexible flat foot, which may coincide with either in toeing or out toeing. Typical presentation of the flexible flat foot is an apparent “normal” arch in non-weight bearing, with hyper-mobility and excessive vertical collapse of the arch in weight bearing. Common adaptations in gait are in toeing and toe walking, both mechanisms that have a supinatory effect on the foot. With the inability to adequately lock the Mid-Tarsal Joint, functions such as efficient running, jumping and balancing on challenging surfaces are impaired, not to mention muscle fatigue and abnormal shoe wear. The challenge of early diagnosis is that it is normal to have an apparent low arched foot before the age of three and most children do not have a well-developed arch before age four. X-rays, gait analysis and

physical exam by a podiatrist can help guide parents on whether their child's foot is normal. Most children with mild to moderate flexible flat foot benefit from sturdy shoes and a pre-fabricated orthotic device as an important part of their treatment.

Conversely, having an excessively rigid high arched foot can also lead to abnormal biomechanics. Hypo-mobility in the foot leads to poor shock attenuation through the limbs and axial skeleton. Often, permanent damage to joint cartilage and ligaments has already occurred by the time parents seek help for their child. Abnormal foot mechanics is not really much different than a car out of alignment. Abnormal tire wear is a “symptom” of a mal-alignment. It makes no sense to change the tires (or take an anti-inflammatory) before you fix the underlying mal-alignment with proper footwear and orthoses if necessary.

Children who wear inappropriate or ill fitting footwear can develop foot deformities later in life. Bunions, corns, calluses, and hammertoes can all be medical consequences of ill-fitting, inappropriate footwear options. Children are also at risk for developing ingrown toenails, and fungal nail infections due to shoes fitting too tightly. Friction from tight fitting shoes can cause the nail to grow abnormally and into the skin. Poor air flow can create moist environments where fungal spores can flourish. Foot health greatly depends on properly fitted footwear.

### **Measurement and Fit**

Once we as podiatrists have decided the degree of supportive footwear that is necessary, determining the proper fit is the next step for the parents. Children’s feet should be measured monthly to ensure that the child is wearing the appropriate size. Children typically outgrow a pair of shoes before they wear out the shoes. Parents should perform monthly checks to determine whether their child has outgrown his or her shoes. They should be instructed to palpate the tip the hallux (or longest toe) and the ball of the foot. There should be 1 cm of space between the tip of the longest toe and the end of the shoe. In addition, the ball of the foot (the widest part of the foot) should be in the widest part of the shoe. If there is not enough room in the toe box, the child’s toe movement is restricted. Constricting shoes also restrict blood and air flow. It is important to consider that the risk of developing foot problems later in life, such as hammertoes and bunions, is reduced when a child wears properly fitting shoes. It is critical that the parent check the fit of his child’s shoes regularly and purchase new shoes when the child has outgrown them, not when the shoes are worn out.

When purchasing new shoes for a child, it is important that he or she be present to try them on. The child should first be measured with a Brannock device to determine which shoe size to begin with. Ensuring that both feet are measured while the child is weight-bearing is critical. It is common to have one foot that is slightly larger; therefore, measuring only one foot could result in purchasing the wrong size. The child should also wear the socks that he or she normally wears. Proper fit depends on finding footwear that accommodates the length, width and

thickness of the foot. Observe for excessive heel slippage during gait. If excessive heel slippage is noted, try a different size or style/last. Always encourage the parents of children to have them walk around in the shoes to make sure they fit comfortably. If a child wears an orthotic, SMO or AFO, parents should bring that device with them to ensure that it will fit into the shoes. If a child is not available to try on shoes, providing the pedorthist or shoe fitting clerk with a tracing of the child's foot is an option. Relying on an assumed child's shoe size alone may result in ill-fitting footwear. Although tempting as a cost cutting measure, parents should be discouraged from purchasing shoes with "room to grow." The child will struggle to keep the shoes on properly, causing his foot to shift back and forth in the shoe, potentially causing blisters. In addition, for the most accurate fit, taking a child shoe shopping later in the day when swelling of the feet will be more pronounced. This is even true in kids! Purchasing the correct size, and maintaining proper fit is important to maintaining foot health.

### **Picking out footwear**

Once the child has tried on several pairs of shoes, determine if the shoes are appropriate for the child's needs. Exposing the natural internal sole of the shoe will tell you a great deal about the manufacturing quality of the product. Look for a smooth surface that is free of glues, rough spots, or exposed materials that can cause abrasions, breakdown and discomfort. Closely examine the shoe to see what role the insoles play in creating a firm, supportive cavity. The support and strength of the shoe should be by construction, not by the use of the insoles. Examining footwear closely will help you to ensure the quality of the child's shoes.

### **What to consider if your child wears an orthotic, AFO or SMO**

If the child wears orthotics, an SMO, or an AFO, finding appropriate footwear to accommodate these devices can be a daunting task. Even pre-fabricated foot orthoses, such as the littleSTEPS pediatric orthotics are being designed with deeper heel cups and correction to spare the parent the cost of the out-growth of comparable custom devices. Therefore, there is a rapidly increasing need for accommodative footwear. A great deal of effort is placed in finding shoes that are wide enough, deep enough, and long enough. Unfortunately, until recently, this search often ended in parent's purchasing shoes that were as much as two sizes larger than the natural foot to satisfy the demands of the orthotics. To keep up with the growing demand to accommodate orthotics, footwear companies such as Keeping Pace and Sure Step are designing shoes specifically with children's adaptive footwear needs in mind. Here are some important elements to look for in choosing a specialty shoe:

- Internal engineering with adjustable depth technology
- Wider heel and toe box that accommodates the orthosis without compromise
- Distinctive sole with increased contact surface to promote greater medial/ lateral stability

- Ankle to toe speed lacing with locking eyelets for faster on-off and ease of wear-ability
- Geometrically graded last that ensures precision fit
- Fray resistant lining and high abrasion resistant toe cap to ensure durability

When looking for an extra depth shoe, it is important to note that a shoe that has more than one insole does not necessarily mean that it is deeper and will accommodate an AFO, SMO or orthotic. It is necessary to take a look at the depth gained upon removing the insole and what happens to the integrity of the shoe once the insoles are removed. Also, children wearing rigid AFOs do not require flexible soles due to the rigid AFO. The more firm the rubber bottom sole, the higher the abrasion tolerance particularly for toe draggers, children who scissor and those with challenging gait patterns.

The differences between a regular athletic shoe and footwear from companies such as Sure Step footwear include depth, durability and flexibility. Perhaps the most unique feature is the tread design which allows the foot to intrinsically move. The sole is equipped with two extra deep cross cuts to provide the necessary flexibility to allow a “break” as the third rocker is approached, facilitating more normal, natural movement of the foot through push-off. The wide, rounded toe box with extra depth makes fitting these unique shoes over AFOs, SMOs, or other orthoses, an easy task. The additional 3/8” instep depth accommodates any dorsal strapping that an orthosis may contain. Each shoe comes complete with two 1/8” removable inserts, making slight leg length discrepancy adjustments a quick and easy task. When greater adjustments are needed to the shoe height, a cutline is provided to make sole removal worry free.

### **Best foot forward**

In the past, footwear options for children using braces and orthotics were dismal. Children who require specialty shoes want to be as fashionable as their peers. Fortunately, some companies, such as Keeping Pace and Sure Step, offer contemporary fashion and stylish looks in addition to well engineered design. Fashion is important to children: if children like the look of their shoes, they will wear them.

Some fashion choices, like high heels for adolescent girls, should be avoided due to the numerous health consequences. High heels confining shape, and height of the heel creates an uneven distribution of weight which can increase risk of bunions, hammertoes and other foot deformities. Lately, there is also a trend of wearing shoes very loosely laced. Appropriate footwear requires proper lacing techniques. Without proper lacing techniques, the foot is not secured in the shoe, and can be vulnerable to instability and injury. Laces that are too tight can interfere with circulation and may also cause injuries, such as tendonitis.

Supportive, stable footwear is critical to maintaining foot health. Whether the footwear is supporting a child during sporting activities, or stabilizing him while jumping and playing, footwear protects feet from injury when appropriate choices are made. Although there can be many different factors to consider, especially when accommodating an orthotic, AFO or SMO, the benefits are astounding. Giving a child the gift of greater mobility ensures his overall health and wellbeing for many years to come.

**About the Author:**

Louis J. DeCaro DPM (Podiatric Physician) specializes in pediatrics with a special interest in sports medicine and biomechanics. He is a member of the American College of Foot & Ankle Pediatrics and a member of the surgical & medical staff at Cooley Dickinson Hospital and Franklin Medical Center. He is currently in private practice with two private offices located in South Deerfield, and Easthampton MA. He is the director and founder of the Multidisciplinary Adult & Pediatric Gait Labs Biomechanics Clinic which takes place biweekly at his Easthampton office.

Dr. DeCaro founded and chaired a weekly Lower Extremity Podo-Orthopedic clinic which was held at Cooley Dickinson Hospital in Northampton MA from 2006-2010, but he now runs the clinic out of his private offices. At this clinic Pediatric patients are evaluated for any lower extremity issue both by monitoring gait patterns and examining static biomechanical findings. Dr. DeCaro routinely works alongside Pediatric Rehabilitation Specialists, Orthotists, and Pedorthists.

As a practitioner, and someone who recognizes the progression of foot types, his goal is to prevent pain by knowing how to deal with it before happens, coupled with improving overall biomechanical strength and structure. Dr. DeCaro is co-owner of Nolaro24, he has been instrumental in co-creating littleSTEPS and QuadraSteps orthotics, affordable and effective alternatives to custom foot orthoses, as a solution to biomechanical concerns.

*In the future, please feel free to reference websites [www.footorthoticsforkids.com](http://www.footorthoticsforkids.com) and <http://www.decaropodiatry.com>. For additional information or questions regarding the practice and its methodologies please email [louisdecaro@decaropodiatry.com](mailto:louisdecaro@decaropodiatry.com).*

