

Arch Development in Children: When Are Orthotics Necessary?

by Robert S. Striker, DC, MBA

Normal development of the longitudinal foot arch in children is now much better understood. We are not born with arches, but most children begin to show evidence of their eventual adult foot alignment soon after they start walking. The use of corrective shoes and inserts before the age of six is controversial, and has little scientific support.¹ In those children who do not demonstrate normal foot alignment by age six, support for the medial longitudinal arch, including custom-made stabilizing orthotics should be considered.

Natural History of the Foot

The development of the growing child's foot is an ongoing process tied closely to maturation of the nervous system and growth of all structures in the lower extremity. The lower extremities change significantly during early development, especially as we begin to walk. Initially, we see significantly bowed legs, noticeable out-toeing, and no evidence of a medial arch. The arches slowly become more obvious and increase in height as our gait improves. The foot grows faster than the rest of the body; it achieves three quarters of its mature length by the time the child is seven years old. By six or seven years of age, most children have also developed their adult medial arch, although some take until age ten or eleven to complete development.²

Orthopedic Shoe Interventions

After many decades, in which thousands of young children were forced to wear special shoes and corrective inserts, two independent studies published in 1989 demonstrated that wearing orthopedic shoes or arch inserts does not seem to influence the development of the foot's arches.^{3,4}

The first study evaluated the effects of the use of corrective orthopedic shoes, a Helfet heel-cup, and a custom-molded rigid plastic insert. One hundred and twenty nine children with flat feet were randomly assigned to receive one of the interventions, or to be in the control group, which wore only good leather shoes. The fit of the shoes and the inserts were re-checked every 3 months. At the end of three years, comparison x-rays found no difference in the treatment groups. The researchers concluded, "Flexible flatfoot in young children slowly improves with growth, and intensive treatment with corrective shoes or rigid inserts for a three-year period does not alter the natural history."³

A second prospective study followed 125 toddlers from ages one to five as they wore one of four different types of shoes. Their arches developed the same, whether they wore normal supportive shoes, shoes with a medial arch support, orthopedic shoes with solid shanks, Thomas heels and inside heel wedges, or the orthopedic shoes with medial arch supports added. The study found that, while the shoes with a medial arch support enhanced development of the longitudinal arch in the first 2 years, by the age of 5, all groups were identical. The conclusion: that "arches developed regardless of the footwear worn, but development was faster during the first 2 years (until age 3) with arch support footwear."⁴

Orthotic Recommendations

Children do not usually need to be evaluated for custom orthotics until about the age of six years. If at that time a child is still not developing a normal arch, or if in-toeing or out-toeing persists, spinal pelvic stabilization may be needed to prevent postural and gait problems. This is particularly true when the child is involved in athletics and sports activities. In these cases, custom-made stabilizing orthotic support for the arches can significantly improve gait and running performance. Otherwise, many children are well-served by wearing sensible, flexible shoes.

If there is a family history of flatfeet or in-toeing, a more aggressive use of child-specific orthotics is appropriate. These should be particularly flexible to allow for normal growth and development, yet they should also provide the necessary amount of support and motion control. Of course, the parents must be informed of the need to regularly re-fit the orthotics as the child's foot grows. The shoe size and orthotic fit should be checked at least every six months, with new orthotics supplied whenever the foot increases more than 1½ shoe sizes.

We now know that there are only a few rare cases when children need special "orthopedic" or "corrective" shoes. Most kids will develop healthy leg, foot and arch alignment, as long as they are not forced into poorly fitted, inflexible shoes. Children who are active in sports or who demonstrate persistently inefficient or awkward gait patterns are especially good candidates for custom-made, stabilizing orthotics designed to support their developing arches. Flexible orthotics are particularly helpful for children who show evidence of persisting biomechanical problems beyond the age of six.

References

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