



# POSNA

## The Core Curriculum

### **Pes planovalgus**

#### **Objectives**

1. Define pes planovalgus and list other terms used to describe the pediatric flatfoot
2. Discuss the natural history of the physiologic flatfoot of early childhood
3. Describe the examination of a child suspected of having hypermobile flatfoot with tight heelcord
4. Describe indications for treatment of pes planovalgus in children and the nature of the intervention indicated

#### **Discussion point**

1. Do shoes, inserts, or braces influence the development of the child's foot?

#### **Discussion**

Pes planovalgus, also known as flatfoot, or physiologic flatfoot is essentially a normal variant. The longitudinal arch is not visible in toddlers, and is not evident in most children until about age 6. The borderline between physiologic and pathologic flatfoot at any age is poorly defined, ethnologic studies have demonstrated that a significant proportion of the world's population could qualify as flatfooted. Young children with physiologic flatfoot characteristically have signs of generalized ligamentous laxity described by Wynne-Davies; hyperextension of knees and elbows, hyperextension of wrist and fingers so the fingers are near parallel with the forearm when both wrist and fingers are passively dorsiflexed, opposability of the thumb to the forearm, and excess ankle dorsiflexion. Children with flatfeet and ligamentous laxity require no treatment. A symptomatic flatfoot requires an investigation for etiology. Painful idiopathic flatfeet in very obese children may constitute a subcategory of physiologic flatfoot. Tarsal coalition or spinal dysraphism should be considered if there is a change in foot posture. Untreated congenital vertical talus may present as a flatfoot. Neuromuscular causes include some children with muscular dystrophy at the time of their initial presentation and cerebral palsy.

The most common cause of painful flatfeet in children is the entity of hypermobile flatfeet with tight heelcords described by Harris and Beath. The foot pronates to accommodate a contracted heelcord. Therefore, to test mobility of the heelcord, the foot is first supinated with the knee extended, and then flexed. In the presence of a tight heelcord, apparent dorsiflexion of the foot is appreciably greater with the foot pronated (allowing lateral displacement of the calcaneus and motion at the calcaneocuboid and talonavicular joints) than with the foot supinated. Treatment of this entity is initially heelcord stretching; percutaneous heelcord lengthening for refractory cases may be considered. For longstanding cases, such as seen with cerebral palsy, lateral column lengthening may be indicated.

In general, flatfeet have traditionally been overtreated. There is no published data documenting improvement in foot posture with inserts or braces. A trial of prescription shoes for young children showed no change in foot posture over routine footwear.

Flatfoot secondary to rupture of the posterior tibial tendon, relatively common in adults, has been reported in children, but is very rare.

## References

1. Garcia-Rodriguez A, Martin-Jimenez F, Carnero-Varo M, Gomez-Gracia E, Gomez-Aracena J, Fernandez-Crehuet J. Flexible flat feet in children: a real problem? *Pediatrics* 1999;103(6):e84.
2. Harris RI, Beath T. Hypermobility flat-foot with short tendo-achilles. *J Bone Joint Surg (Am)* 1948;30:116-40.
3. Luhmann SJ, Rich MM, Schoenecker PL. Painful idiopathic rigid flatfoot in children and adolescents. *Foot & Ankle International* 2000;21(1):59-66.
4. Staheli LT, Chew DE, Corbett M. The longitudinal arch: A survey of eight hundred and eighty-two feet in normal children and adults. *J Bone Joint Surg (Am)* 1987;69:426-28.
5. Staheli LT. *Fundamentals of pediatric orthopaedics*. New York: Raven Press; 1992.
6. Sullivan JA. Pediatric flatfoot: Evaluation and treatment. *J Am Acad Orthop Surg* 1999;7:44-53.
7. Tareco JM, Miller NH, MacWilliams BA, Michelson JD. Defining flatfoot. *Foot & Ankle International* 1999;20(7):456-60.
8. Wenger DR, Mauldin D, Speck G, Morgan D, Lieber RL. Corrective shoes and inserts as treatment for flexible flatfoot in infants and children [see comments]. *Journal of Bone & Joint Surgery - American Volume* 1989;71(6):800-10.
9. Wynne-Davies R. Familial joint laxity. *Proceedings of the Royal Society of Medicine* 1971;64(6):689-90.