

## Foot development in infancy and early childhood

**Foot development is important. Changes in the shape, structure and function of feet occur throughout infancy, childhood and into late adolescence. During infancy (birth – two years old), there are rapid changes in foot size and shape. Health visitors should consider healthy feet as key to supporting infants as they begin to stand, learn to walk and explore their world. Understanding about how feet change in size, structure, shape is helpful to convey positive health messages and reassurance where needed.**

**This Good Practice Points (GPP) resource is the first in a series of two GPPs. The second GPP covers an overview of walking development in infancy and early childhood.**

During early weight bearing, the feet are flat and very mobile. The foot bones are very small, soft, and the joints are not fully formed. The forces applied to the feet when moving and weight bearing are important for the healthy development of the bones and other tissues, but excessive demands on the feet can be detrimental. Obesity is increasingly seen as a factor that can impact healthy foot development, increase pain and discomfort (Mueller et al., 2016) and contribute to considerable orthopaedic problems (Nowicki et al., 2019).

Infants should not be encouraged to weight bear before they are ready and use of equipment, such as baby bouncers or other devices that encourage early standing or walking, remain controversial (Garrett, McElroy and Staines, 2002). If used cautiously and in short bouts, these can be fun and stimulating but the impact of excessive loads on the developing skeleton and the increased risk of accidents due to increased mobility should be considered. No research has examined the effects of baby walkers and bouncers on the development of the feet. Nevertheless, it is important that infants are encouraged to move naturally, to practise their movements without constraint, and experience the appropriate sensory stimulus.

Once infants begin to pull-to-stand, cruise and start walking, parents begin to pay more attention to their infant's feet and this is when parental concerns commonly arise. Recent evidence has found that parents' concerns are often related to the shape and development of children's feet, how they are walking, whether development is typical (or not), and their need for information on the most suitable types of shoe that they should buy for their child (Hodgson et al., 2019). The following points on footcare, footwear and times to refer will help health visitors respond to these common queries.

### Good Practice Points for HVs

#### Footcare

- Good foot hygiene is important. Parents can be encouraged to check their infant's feet regularly and advise them to look out for cuts, abrasions or nail problems.
- Cutting the toenails (and fingernails) can be troublesome as the nails can be soft or growing vertically. Encouraging parents to establish a routine with nail-cutting is helpful. Parents can be signposted to advice on nail-cutting techniques and nail management (see NHS resource on washing and bathing your baby).

**More information on page 2**

**For additional resources see [www.ihv.org.uk](http://www.ihv.org.uk)**

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- Parents can be encouraged to get their children involved in good foot health practices from early on. In the early years, this can involve stories about feet and shoes (such as Dr Seuss The Foot Book). As they grow, this can involve children being asked to look after their feet (such as wearing shoes when playing on rough terrain) and encouraging discussion about feet and shoes during different activities.
- Parents may be concerned about skin infections (such as verrucae) but these are more common in the older child. Podiatrists can advise on how to manage these issues. There is also a Clinical Knowledge Summary published by the National Institute for Health and Care Excellence (see below).
- Poorly fitting footwear can often lead to skin irritations and may cause discomfort if feet are cramped by tight shoes or socks. Parents should be advised that they are choosing shoes that look after their infant's feet but also teaching them about the importance of looking after their feet.

## Footwear

- Infants should be encouraged to be barefoot as much as possible. This allows them to experience their environment and helps with sensation and awareness. This also encourages their navigation and understanding of their environments. Through play, young children should be encouraged to experience lots of different sensations (such as sand, carpet, grass) although there is no evidence for the impact of barefoot activities on motor development.
- Footwear is important for protection and should typically be considered once the infant is walking independently and ready to explore the outside world. Shoes should help protect the feet from injury, keep them dry and warm. There is some evidence that shoes that don't fit properly will affect children's foot movements but more research in this area is needed (Cranage et al., 2019).
- Foot growth takes place throughout infancy and childhood so regular inspection and measurement of footwear is important. On average, foot length will increase by approximately 2 mm per month up to three years of age (although the evidence requires updating - Gould et al., 1990), with the recommendation that children should have their feet measured every 6 – 8 weeks. In the early years, the feet are very flexible and respond to what is put around them, and shoes should not constrict the development of the feet. Similarly, parents should be encouraged to check the fit of socks, blankets and baby-grows to make sure they are not too tight around the feet.

- Many shoe shops have trained staff who can advise parents on what shoes are best, but it is recognised that access to trained staff is not always feasible or affordable. Parents can be directed to information that will support their understanding about footwear, and many footwear retailers have useful tips on their websites, such as how to measure children's feet. Parents can be advised that the cost of a shoe does not necessarily make the shoe a "good" shoe. It is important for parents to think about:
  - Size and width. Different width fittings can be difficult for parents to find. Sometimes feet can be different sizes but it is important that the shoes fit correctly.
  - Comfort and support. Shoes should not be too hard as these will be uncomfortable. Equally, the shoes should not be too soft. For example, the back of the shoe should be flexible but not squashed easily.
  - Velcro or straps. The shoe should have something (such as Velcro straps) to keep the shoe on the foot.
- If additional specific advice on footwear is needed, health visitors can signpost parents to local podiatrists or physiotherapists, or liaise with them directly for additional support.

## When to refer

Health visitors are likely to encounter a range of queries related to children's feet and it is important to understand local procedures and referral pathways for managing these. Some of the common concerns that health visitors encounter that may warrant referral include:

- **Congenital Talipes Equinovarus** (CTEV) is the most common congenital foot problem and is typically identified antenatally, or during the postnatal examination (see additional resources for further information). Once identified, infants should be referred to the appropriate clinical services.

CTEV will not improve on its own and treatment will be needed to correct this within the first few months of life. Treatment involves plaster-casting and manipulation of the feet (the Ponseti method) and special boots (Ganesan et al., 2017). Treatment would typically start around 2 weeks of age and the plaster casts are changed weekly until the foot position is corrected. A small surgical procedure and special boots would typically follow. Parents may be overwhelmed with a diagnosis of CTEV but parent-facing resources are widely available and offer additional information and further support (see Steps Worldwide in the additional resources). CTEV may be referred to as clubfoot or talipes.

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- **Positional talipes** (EquinoVarus) is quite a common foot condition in newborn babies. It may affect one or both feet. It causes the foot to turn down and inwards when in the rested position but remains flexible. Therefore, the foot can easily be moved into the expected position. It is thought to occur due to the baby's position in the mother's uterus. Positional talipes is typically treated with exercise and gentle stretches.
- **Metatarsus adductus** is a common positional deformity and, when determined to be a flexible presentation, is thought to resolve without the need for intervention (Williams, James and Tran, 2013). Treatment (such as casting) would be used in severe cases, or where there is inflexibility within the foot. If there are concerns about the severity or flexibility of the feet, referral for assessment is indicated.
- **Flat feet** are common, and parents often report concerns with foot position and development. The feet will be flat when infants first begin standing and learning to walk. As the feet grow and develop, they will undergo changes until approximately 6 years of age (Uden, Scharfbillig and Causby, 2017). Intervention is not typically required unless there is pain, functional impairment, or problems with development. It is important to recognise the concerns that parents have and, when indicated, refer to the appropriate health professional (e.g. GP and possibly Paediatric Podiatrist).
- **Tiptoe walking** can be a common feature in newly walking infants but persistent tiptoe walking (e.g. after two years of age, or later onset in childhood) warrants further investigation. Idiopathic tiptoe walking is seen in some older children and is a diagnosis of exclusion, i.e. when all other causes have been ruled out (Caserta et al., 2019).

- **Sensitivity issues** (e.g. not tolerating feet being touched) might suggest sensory processing problems. Problems with processing different senses can impact on gross motor skills, balance, and co-ordination, and early intervention may benefit developmental outcomes (Eeles et al., 2013).

## Useful Resources

**National Institute for Health and Care Excellence:** Warts and Verrucae. <http://bit.ly/3bGOaHz> [Accessed 15.01.21]

**Global ClubFoot Initiative:** <http://bit.ly/38JAolt> [Accessed 15.01.21]

**NHS:** Club Foot. <http://bit.ly/3qq7M78> [Accessed 15.01.21]

**NHS:** Washing and bathing your baby. <http://bit.ly/3srVAV5> [Accessed 15.01.21]

**Steps Worldwide:** <http://bit.ly/3sABhVJ> [Accessed 15.01.21]

## References

- Caserta, A. J. et al. (2019) 'Interventions for idiopathic toe walking', Cochrane Database of Systematic Reviews. John Wiley and Sons Ltd. doi: 10.1002/14651858.CD012363.pub2.
- Cranage, S. et al. (2019) 'The impact of shoe flexibility on gait, pressure and muscle activity of young children. A systematic review', Journal of Foot and Ankle Research. BioMed Central Ltd., 12(1), p. 55. doi: 10.1186/s13047-019-0365-7.
- Eeles, A. L. et al. (2013) 'Assessments of sensory processing in infants: A systematic review', Developmental Medicine and Child Neurology. Dev Med Child Neurol, pp. 314–326. doi: 10.1111/j.1469-8749.2012.04434.x.
- Ganesan, B. et al. (2017) 'Ponseti method in the management of clubfoot under 2 years of age: A systematic review', PLoS ONE. 12(6). doi: 10.1371/journal.pone.0178299.
- Garrett, M., McElroy, A. M. and Staines, A. (2002) 'Locomotor milestones and babywalkers: cross sectional study', BMJ, 324(7352), p. 1494. doi: 10.1136/bmj.324.7352.1494.
- Gould, N. et al. (1990) 'Foot Growth in Children Age One to Five Years', Foot & Ankle International. Foot Ankle, 10(4), pp. 211–213. doi: 10.1177/107110079001000404.
- Hodgson, L. et al. (2019) 'First steps: Parent health behaviours related to children's foot health', Journal of Child Health Care. SAGE PublicationsSage UK: London, England, p. 136749351986475. doi: 10.1177/1367493519864752.

Mueller, S. et al. (2016) 'Influence of Obesity on Foot Loading Characteristics in Gait for Children Aged 1 to 12 Years', PLOS ONE. Edited by J. L. McCrory. Public Library of Science, 11(2), p. e0149924. doi: 10.1371/journal.pone.0149924.

Nowicki, P. et al. (2019) 'The Role of Obesity in Pediatric Orthopedics', JAAOS: Global Research and Reviews. Ovid Technologies (Wolters Kluwer Health), 3(5), p. e036. doi: 10.5435/jaaosglobal-d-19-00036.

Uden, H., Scharfbillig, R. and Causby, R. (2017) 'The typically developing paediatric foot: how flat should it be? A systematic review', J Foot Ankle Res. 2017/08/15, 10, p. 37. doi: 10.1186/s13047-017-0218-1.

Williams, C. M., James, A. M. and Tran, T. (2013) 'Metatarsus adductus: Development of a non-surgical treatment pathway', Journal of Paediatrics and Child Health. J Paediatr Child Health. doi: 10.1111/jpc.12219.

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