



Normal foot of a 6-month-old child / Elderly foot damaged by footwear

Feet for life – does footwear help or hinder child foot health?

Over the years footwear has contrived to damage feet. Dictates of fashion and ignorance related to the risks involved in wearing particular types of footwear and a lack of not having shoes properly fitted to the foot have resulted in this unfortunate outcome. The images shown above clearly demonstrate how a lifetime in footwear can turn a normal child's foot into a deformed and painful adult foot.

Footwear was designed initially to protect the foot against the elements and injury and now, with modern technology and manufacturing methods, to offer support with different specialist shoes designed for different purposes. This aim is defeated if the shoes do not fit properly through a lack of appropriate fitting facilities or if there is ignorance of the necessity for this facility by both purchaser and retailer.

Evidence suggests there is a high degree of ignorance and possible complacency regarding the prevention of foot problems. Research by the UK-based Society of Chiropodists and Podiatrists and by other bodies has provided clear data relating to the poor state of child foot health and the potential for long term foot and postural problems. It addresses four broad areas discussed below.

Foot and footwear problems

Previous surveys have shown that 91% of children in the UK have problems with their feet or footwear and that 89% of adults require some form of foot care. More recent research has shown that only 6% of parents check their child's feet when they buy a new pair of shoes. 23% do not check them at all and 23% only do so when the child indicates that there may be a problem. Work by MacAskill and Watt from Glasgow Caledonian University found evidence that indicated some 83% of primary

school children at 5 years of age are wearing footwear that is too small.

A study by Watt conducted with secondary school children showed that parents' footwear buying habits were leaving their children at risk from future foot problems as up to 29% were not present when their shoes were bought and up to 95% did not have their feet measured. 59% of girls and 49% of boys were wearing footwear that was too small.

This indicates a huge potential for future foot problems, which is compounded wherever inappropriate footwear is included. Feet may be damaged for a variety of reasons that fall broadly into five risk categories:

- The developing foot
- Intrinsic risk factors
- Inadequate footwear
- Poorly fitted footwear
- Combination factors

The developing foot

It should be remembered that the child's foot is not a small version of the adult foot as it is structurally and functionally different, making constant changes to the effects from the developing skeleton with its constant postural changes. This can have an effect on the foot posture and the correct type of footwear for a particular developmental stage is very important.

Very young children's feet are particularly at risk as they are still growing and are relatively 'soft' compared to the adult foot. They are composed of varying amounts of relatively soft hyaline cartilage with the adult foot being structured from bone. The child's foot therefore may be more likely to be deformed by inappropriate footwear.

Intrinsic risk factors

This includes feet which are particularly at risk and especially those which are:

- Hypermobile (a range of mobility beyond the accepted norm)
- Long and very slender in relation to its length
- Triangular in shape with the heel being very narrow relative to the forefoot

These represent challenges to the shoe fitter particularly when they occur in combination and may make acceptable shoe fitting impossible if a range of sizes and fittings are not available in the retail outlet.

Furthermore, biomechanical compromise may be present where the foot is inherently unstable. This may be due to inherited characteristics with the foot liable to excessive subtalar joint pronation and the development of a flat foot. This type of foot requires not only excellent fitting provision but also a shoe that will control the posture of the foot during locomotion so that it is not compromised and will not have an effect on the general posture and gait. In addition, if a general postural abnormality is present, this will impact on the foot as it attempts to compensate for the abnormal posture and gait.

Inadequate footwear

Inadequate footwear encapsulates many factors, namely:

- An unsuitable toe shape where the shoe is not foot shaped
- A shallow toe
- A lack of adequate retaining medium
- A raised heel height with a narrow base (stiletto)
- A lack of shock absorption in the heel and soling material

	First Year		Second Year		Third Year		Total	
	Male	Female	Male	Female	Male	Female	Male	Female
Yes	26%	22%	21%	8%	16%	5%	21%	10%
No	74%	78%	79%	92%	84%	95%	79%	90%

- A poorly shaped and ineffective counter and, in particular, a lack of support in the hind and inner aspects of the foot
- Synthetic materials and linings which may predispose to fungal (athlete's foot) and viral (verrucae) infections and encourage infected in-growing toenails and sweaty (hyperhidrosis) and smelly (bromidrosis) feet.

Poorly fitted footwear

This appears to be an increasing issue and is possibly due to the reduction in specialist children's retail outlets where a wide range of sizes and fittings (including specialist fitting services) are available. There has been a significant move by high street chains and supermarkets to make measuring and fitting DIY or not provide it at all. This applies especially to footwear bought off the peg whilst the child is not present. Socio-economic issues may also be a factor, as mass produced footwear is cheaper but may be of poor construction with fitting for length largely a matter of guess work and no range of width fittings available.

The following table shows the response in a study of secondary school children where they were asked, "Did you have your feet measured when the shoes that you are wearing today were bought?" It should be noted that 9 out of 10 girls and approximately 8 out of 10 boys did not have their feet measured. ➤

Bibi's Change System

Bibi Calçados, the well known Brazilian manufacturer of children's footwear has over 56 years of experience in caring for the little feet of thousands of children all over the world. Besides its own product research, it takes advice from Dr. Egon Henning, an expert in children's orthopaedics, as well as input from Brazil's Centro Tecnológico do Calçado (SENAI). The philosophy since 1949 has been to create the best Kids footwear without giving up the joy of being a child. The result has been healthy footwear, with modern design in bright, happy colours. The latest innovation is the Change System that allows parents to check the growth of their baby's feet in order to avoid tight shoes. Like so many good ideas, it is very simple. The soles are made from transparent TPU with markings to show the maximum foot size that will safely fit. The insock is anti-microbial latex and removeable so parents can monitor the child's foot growth and see when the shoes are becoming too small. The shoes are made from size 16 to 21 Continental and are targeted at babies of 2 months to 1 year of age. At this stage of development, their feet grow quickly and are made of 40% cartilage, so if the shoe is too tight, it can cause permanent damage. As there is no sole wear in this age group, the transparency remains and so the system is a positive aid in preventing that kind of problem.



*Athlete's Foot*

A combination of factors

Unfortunately, the above risk categories can be present in combinations often with a painful and unpleasant outcome for which the child or parent may need to seek treatment. This leads to the misconception that ingrowing toe-nails, athlete's foot, verrucae, sweaty and smelly feet are the main foot problems associated with inadequate footwear.

This is actually not the case, as inadequate footwear can result in secondary foot deformities which may include claw toes, retracted toes, hammer toe, mallet toe and hallux valgus (bunions) with the secondary prospect of painful corns and callosities requiring regular professional management in adult life (see image of an elderly foot damaged by footwear, page 28). Children rarely develop corns and callous and this should not be used as an indicator for current or future problems in a child. In the short term, the foot problems will appear as relatively minor with pressure marks, blisters, bursae and sores.

As stated previously it must be remembered that the foot cannot be regarded in isolation. Issues causing problems with the posture of the foot affect the general posture and vice versa, with the risk of more serious problems that result in structural and postural abnormalities affecting the knees, hips and spinal posture possibly, resulting in osteoarthritis in later life and in the prospect of surgery.

Particularly problematic footwear

The dictates of fashion and peer group pressure amongst teenagers in particular may undermine good foot health. This factor now appears to be moving into much younger age groups with very young children wearing footwear that was usually worn by the teenager, adolescent and adult. It is noticeable that many mothers dress their children as mirror images of themselves—including their footwear. The problems associated with this tend to be seasonal but currently there are two main issues: high heeled and very flat shoes.

When high-heeled unstable court shoes are worn, or very flat 'dolly shoes' with little protection to the sole of the foot, and when the shoe is of poor construction with little or no support, the young foot is, particularly at risk. The high and unstable heel with a constricting toe shape can lead to all of the secondary features cited above under a combination of factors.

A very flat shoe tends to put added strain on the arch of the foot resulting in heel pain (plantar fasciitis and bursitis), and

*In-growing Toe-nail*

pain at the back of the lower leg (achilles paratendinitis). This can also affect growing bone and cause chronic heel pain. These pathologies often have a sudden onset particularly where there is a sudden change to increased activity, growth, weight gain or a change from a high heel to a low heel. These problems tend to be acute, often very debilitating, difficult to treat and can continue into adult life.

*Girls shoe with too high heel*

Conclusion

Footwear can be immensely helpful in ensuring the child's foot develops normally if it is of the correct type and fitting for the child's developmental stage. This has traditionally been provided by particular manufacturers with an appropriate fitting service by trained staff. The research indicates that there appears to be a move away from this, possibly for socio-economic or convenience reasons, and that the public and the manufactures require education as to the dangers and outcomes of following this current practice.

All indicators point to a serious situation in regard to child foot health and its impact into adult life, health economics and possibly future quality of life. Indeed, some people are beginning to suggest that a warning tag should be attached to children's footwear that does not pass certain standards. Others suggest a health 'Charter Mark' for those that do. Either way, this would involve testing, accreditation and added cost.

Who would pay for this? While the footwear industry is the main beneficiary of footwear sales, is it the responsibility of the manufacturer or the brand retailing the shoes? Either way, many parents would doubtless complain that shoes would cost more, so perhaps the governments currently setting standards for almost everything else in life should include this one as well. 🌐

All information used in this article by courtesy of Gordon F Watt, D.Pod.M., M.CH.S. Cert. F.E., Registered Podiatrist and Lecturer in Podopaediatrics, Glasgow Caledonian University.