

SYNTHESIS AND CLINICAL IMPLICATIONS

Overall, there is a lack of quality and quantity of studies examining the use of orthotic devices as treatment methods for idiopathic toe walking. Some studies which were pertinent to the research question were studying children with cerebral palsy who toe-walk rather than strictly examining the population of idiopathic toe walkers. These studies were still deemed pertinent to the clinical question presented at the beginning of this CAT because they were looking at the parameters that are of interest in the population of idiopathic toe walkers, however in a slightly different population with a similar problem with similar treatment options. By using clinical judgement, evidence regarding the gait of children with cerebral palsy who toe walk can be generalized to children who are idiopathic toe walkers, making sure to take into account the potential effects of spasticity and other neurological factors on children with CP, as these will most likely not be factors for children who demonstrate a diagnosis of idiopathic toe walking.

One of the studies examined in this critically acclaimed topic evaluated the effects of the use of 2 ankle foot orthoses (AFOs), a rigid AFO vs a dynamic AFO (DAFO) in children with cerebral palsy. The second study examined the population of children who are diagnosed with idiopathic toe walking and compared AFOs to foot orthoses (FOs). Both studies presented relatively inconclusive results, with the first study suggesting that AFOs may be more effective than DAFOs in controlling gait in cerebral palsy due to neurological factors such as spasticity. It also presents research that, from this author's clinical analysis, seemed to suggest that DAFOs might be an effective orthotic device in the population of children who are idiopathic toe walkers due to the DAFO ability to aid strength building while still inhibiting the poor body mechanics that toe walking promotes. The second study looked at children diagnosed with idiopathic toe walking, and found that AFOs affect gait while being worn, but the effects are not retained once the orthotic devices are removed. Foot orthoses, on the other hand, displayed more modest changes in gait while being worn. However, the group that wore FOs significantly maintained a gait pattern displaying more normalized heel off timing when the FOs were no longer worn, suggesting that the FOs promoted better maintenance of a more normalized gait pattern. Both studies suffer from a small number of subjects and low generalizability and could also be improved by addressing some factors that decrease the internal validity, including increasing follow-up with participants to determine any long-term effects.

The future of research for use of orthotic devices in children who demonstrate idiopathic toe walking must continue the path begun by Herrin and Gail, in evaluating the effect of different types of devices in this population, comparing different devices to one another to determine their effects on certain populations and gait abnormalities, and closely analyse gait dynamics and parent satisfaction. This research can be improved by adding in an exercise component to ensure functional strengthening when the children are wearing the braces in order to promote muscle retraining, and hopefully to inspire additional as well as more significant effects of brace wear in this population. These studies could also benefit from long-term follow-up. Obviously, researchers are limited by time, funding, as well as patient and parent compliance. However, once more research controlled trials are performed, and more children are studied, more definitive conclusions can be made on the effects of orthotic device use in this population, perhaps in the form of systemic reviews.

Although this research has room for improvements, an overall determination can be made that different orthoses do effect gait in different ways for different populations. It also seems to suggest that ankle foot orthoses may not be the most effective orthotic device to be used with children who are idiopathic toe walkers, and that dynamic ankle foot orthoses or foot orthoses may be better options. The evidence for either of these two options is not particularly strong, but both seemed to be more effective than AFOs and as such should be considered as treatment options in the clinical setting. The population of children who demonstrate idiopathic toe walking has need for conservative treatment options that are effective as well as aesthetically pleasing. These two studies highlight the need for improved research regarding optimal orthotic device choices for different diagnoses, as well as optimal amount and duration of wear of orthotic devices.