



A literature review of the current use of electrical stimulation for lower limb treatment of children with cerebral palsy

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Keywords

Cerebral palsy, children, electrical stimulation, lower limb

Summary

There are two distinct ways of applying electrical stimulation (ES) as a treatment option for the lower limb of children with cerebral palsy (CP) – orthotic and therapeutic. Therapeutic ES is ES applied as part of an exercise regime whereas orthotic ES is ES applied to enable useful functional movement, e.g. ankle dorsiflexion activated by peroneal nerve stimulation during the swing phase of gait. Therapeutic stimulation has been shown to be an effective intervention in several case studies and in at least one group study. It can improve muscle bulk, joint range of motion (ROM), and has been shown to have beneficial carry over in gait patterns in some studies. It does not appear to be necessary, from these studies, to design a therapeutic electrical stimulator specifically for use by this population. Existing electrical stimulators used for therapeutic stimulation in adults are likely to also be suitable for children.

Only one group has published research on the use of orthotic lower limb stimulation for children with CP and the results were very subjective. This is perhaps surprising when set against the larger amount of research into the use of ES as an orthotic aid for other groups of patients with neurological impairments such as stroke and spinal cord injury. A possible explanation for this may be that a different orthotic stimulation solution (than that used with adults) may be necessary for children with CP that takes account of their greater variety of walking speeds and patterns.

ES for the lower limb of children with CP can be effective for strengthening muscles and increasing ROM. It could be usefully incorporated into existing strategies for the management of CP. More research is required into the use of orthotic ES for the lower limb of children with CP before it is used more widely in a clinical setting. The use of ES for the upper limb of children with CP is also an area of clinical interest (Atwater et al. 1991, Carmick 1993b, Carmick 1997, Scheker et al 1999, Wright & Granat 2000) although this is outside the scope of this review.

Wright PA. A literature review of the current use of electrical stimulation for lower limb treatment of children with cerebral palsy. *Physiotherapy Ireland*, 21(1): 25-28, 2000.

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