

# The first meta-analysis of randomized controlled surgical trials in cerebral palsy (2002)



Another in our series of commentaries on notable papers from the DMCN archives. The full paper is available at [www.mackeith.co.uk](http://www.mackeith.co.uk)

McLaughlin J, Bjornson K, Temkin N, et al. Selective dorsal rhizotomy: meta-analysis of three randomized controlled trials. *Dev Med Child Neurol* 2002; 44: 17–25.

This study is a comparative analysis and meta-analysis of three randomized clinical trials. Children with spastic diplegia received either 'selective' dorsal rhizotomy (SDR) plus physiotherapy (SDR+PT) or PT without SDR (PT-only). Common outcome measures were used for spasticity (Ashworth scale) and function (Gross Motor Function Measure [GMFM]). Baseline and 9- to 12-month outcome data were pooled ( $n=90$ ). At baseline, 82 children were under 8 years old and 65 had Gross Motor Function Classification System level II or III disability. Pooled Ashworth data analysis confirmed a reduction of spasticity with SDR+PT (mean change score difference  $-1.2$ ; Wilcoxon  $p<0.001$ ). Pooled GMFM data revealed greater functional improvement with SDR+PT (difference in change score  $+4.0$ ,  $p=0.008$ ). Multivariate analysis in the SDR+PT group revealed a direct relationship between percentage of dorsal root tissue transected and functional improvement. SDR+PT is efficacious in reducing spasticity in children with spastic diplegia and has a small positive effect on gross motor function.

## Commentary

The establishment of the American Academy for Cerebral Palsy & Developmental Medicine in 1947 had its origins in a group of six physicians (neurologist, two pediatricians, physiatrist, neurosurgeon, and orthopedic surgeon) who believed there needed to be an organization devoted to advancing knowledge about this disorder (<https://www.aacpdm.org>). The Mac Keith Press, under the leadership of Ronnie Mac Keith, grew from the same commitment and led to the establishment of Developmental Medicine & Child Neurology, with a 50-year history of success and now the most influential journal in the field.

These were important milestones in taking an academic approach to the challenges presented by children with CP. Yet most of what we learned over the past 60 years of the Academy and 50 years of the Journal could be described as 'practice to evidence'. The field was dominated by case studies and case series, and occasionally cohort studies, that were presented at the meetings of the Academy and published in the Journal and became the 'evidence' for our practice.

Through the 1970s and into our current practice, there has

been increased demand that clinicians base their practice on evidence derived from properly designed randomized clinical trials, that these trials be integrated through meta-analysis to define the benefit of treatment and that this evidence be translated into practice – 'evidence to practice'.

Our field has had a modest, if not dismal track record, over these years. That is why the paper by McLaughlin et al. represents a landmark as it was the first time that a meta-analysis could be done for a surgical intervention for treatment of spasticity in children with CP. It could be done because three groups of investigators in Vancouver, Toronto, and Seattle had independently completed randomized trials of selective dorsal rhizotomy. These were important studies in their own right, having been initiated because of ongoing questions about benefits and risks.

Also, the meta-analysis could be done because the authors used the same outcome measure, the Gross Motor Function Measure, that had been developed over previous years,<sup>1</sup> highlighted in the first 50th anniversary Commentary.<sup>2</sup> Without the use of common outcome measures the ability to conduct a meta-analysis of studies becomes considerably more difficult.

So, was this study the vanguard for many more like it in the field of childhood disability? A search of Medline from 1950 to the present using the search terms 'cerebral palsy' and 'meta-analysis' revealed only four papers describing a meta-analysis of a therapeutic intervention for CP, one of which was this landmark paper. Not an overwhelming number but perhaps a trend given that all four occurred in the 21st century.

The meta-analysis highlighted here is a key paper in our field. It addressed an important question and used appropriate methodology to integrate the best available evidence. However, to be truly landmark you would like to see such a paper reflect a fundamental shift in the quality of information we have access to in taking evidence to practice. There is a great deal of work to do if 50 years from now we can look back again and reconfirm that this paper was indeed a precursor to a future of better evidence!

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## References

1. Palisano R, Rosenbaum P, Walter S, Russell D, Wood E, Galuppi B. Development and reliability of a system to classify gross motor function in children with cerebral palsy. *Dev Med Child Neurol* 1997; 39: 214–23.
2. Morris C. Development of the Gross Motor Function Classification System (1997). *Dev Med Child Neurol* 2008; 50: 5.