



AOTA Evidence Briefs

Cerebral Palsy

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

CP #1

Neurodevelopmental therapy with infants and children has modest effect

Ottenbacher, K. J., Biocca, Z., DeCremer, G., Gevelinger, M., Jedlovec, K. B., & Johnson, M. B. (1986). Quantitative analysis of the effectiveness of pediatric therapy: Emphasis on the neurodevelopmental treatment approach. *Physical Therapy*, 66, 1095–1101.

Level: I

Meta-Analysis (see *Glossary*)

Why research this topic?

One of the primary objectives of neurodevelopmental therapy with infants and children who have neuromotor dysfunction is to facilitate normal muscle tone in order to maintain normal posture and movement patterns. However, research has not conclusively established the effectiveness of the approach.

What did the researchers do?

Ottenbacher and his associates (1986), all affiliated with the University of Wisconsin–Madison, conducted a meta-analysis of the literature on the use of neurodevelopmental therapy with infants and children with a disability.

The researchers searched the literature online for relevant studies. They then checked the citations in the resulting reports for additional studies. Through this process they identified 37 reports.

To be included in the review, a study had to investigate the effect of neurodevelopmental therapy. The researchers included a few studies that investigated neurodevelopmental therapy in combination with other forms of developmental therapy. Also, a study had to address motor-reflex function or overall development as an outcome, and the participants had to be under 15 years of age. Further, the study design had to be a comparison between at least two groups, one of which received neurodevelopmental therapy and the other of which did not. Finally, the results had to be reported in a way that allowed the researchers to synthesize them and compute an **effect size** (see *Glossary*).

The final sample included nine studies, which involved 371 participants (189 boys, 182 girls). Their average age was 71 months (5.9 years). Together the nine studies tested 35 hypotheses about the effectiveness of neurodevelopmental therapy.

The researchers categorized the outcome measures used in the studies as *motor/reflex function*, *overall development*, and *other*.

What did the researchers find?

The mean effect size for the 35 hypotheses was 0.31. That is considered small. It suggests that the average participant who received neurodevelopmental therapy or a combination of it and another developmental therapy performed better than about 62.2% of the participants who did not receive such therapy.

What do the findings mean?

- The findings suggest a small effect for neurodevelopmental therapy. Therapists interested in studying the effectiveness of neurodevelopmental therapy “should anticipate ‘small’ treatment effects and plan their investigations to include a power analysis to determine adequate sample size. Therapists should use professional judgment to determine clinical implications of the results.
- The findings suggest some directions for research: for example, investigation of the effects of neurodevelopmental therapy with certain age groups or diagnostic categories; exploration of the best time to begin treatment for maximum benefit; and study of the long-term effects of treatment.

What are the study’s limitations?

- Meta-analysis based on 9 studies from 1960–1982 (22–44 years old)
- Population cohort unclear (years when data was actually collected)

GLOSSARY

effect size (*Cohen’s r*)—An effect size is a measure of clinical significance. It provides information about the magnitude of effect of the treatment. Although related to significance, it is not as influenced by the size of the sample. Therefore, it is possible to have an outcome on which the treatment had a large effect (e.g., the treatment group improved a lot more than the control group) and still have a nonsignificant result. If the results have a large effect but no significance, this means that this effect may be sample specific and not generalizable outside the study. There are many different types of effect sizes. What is reported here is Cohen’s r , which can be interpreted in a manner similar to a Pearson’s correlation coefficient:

Effect size r	Size of the effect
<0.99	Negligible
0.10 – 0.29	Small
0.30 – 0.49	Medium
>0.50	Large

Cohen, J. (1977). *Statistical power analysis for behavioral sciences*. New York: Academic Press.

meta-analysis—Meta-analyses are a specific subset of systematic review that statistically combine data from many studies in order to find a common effect. The meta-analysis’ power comes from the ability to statistically digest many different studies and emerge with a final assessment of their common effect.

- Terminology used in this document is based on two systems of classification current at the time the evidence-based literature reviews were completed: *Uniform Terminology for Occupational Therapy Practice—Third Edition* (AOTA, 1994) and *International Classification of Functioning, Disability and Health (ICIDH-2)* (World Health Organization [WHO], 1999). More recently, the *Uniform Terminology* document was replaced by *Occupational Therapy Practice Framework: Domain and Process* (AOTA, 2002), and modifications to *ICIDH-2* were finalized in the *International Classification of Functioning, Disability and Health* (WHO, 2001).

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