AOTA Evidence Briefs

Cerebral Palsy

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

CP #7

Intensive neurodevelopmental therapy benefits young children with motor delay and cerebral palsy

Mayo, N. E. (1991). The effect of physical therapy for children with motor delay and cerebral palsy: A randomized clinical trial. *American Journal of Physical Medicine and Rehabilitation*, *70*, 258–267.

Level: IB1a

Randomized controlled trial, less than 20 participants per condition, high internal validity, high external validity

Why research this topic?

Therapists are enthusiastic about neurodevelopmental therapy for children with cerebral palsy, but research has not established its effectiveness. Neurodevelopmental therapy "aims not only at reducing the domination of abnormal movement patterns but also at encouraging normal purposeful movement" (p. 258). It is both demanding and time consuming for children and their parents. Many health professionals question whether its benefits justify the time and the effort put into it.

What did the researchers do?

Mayo (1991), of the Jewish Rehabilitation Hospital (Chomedey-Laval, Quebec, Canada), sought to address one aspect of the controversy surrounding neurodevelopmental therapy by conducting a study of the changes in development over 6 months, of children receiving intensive neurodevelopmental therapy versus children receiving basic neurodevelopmental therapy.

The researcher drew participants for the study from all children under 2 years of age with motor delay who were referred for the first time to the physical therapy department at Ste. Justine's Hospital (Montreal) from September 1983 to September 1984. Fifty-eight children met the criteria for inclusion in the study, and the parents of 29 of them consented to participation. (Neither the gender nor the age of the children was reported.) The researcher randomly assigned them to an intensive-treatment group or a basic-treatment group.

The intensive-treatment group received neurodevelopmental therapy once a week for 6 months. Each session lasted for 1 hour. The group also participated in a home program individually tailored to each child. An illustrated booklet supporting the home program showed parents how to position, handle, and stimulate their child.

The basic-treatment group received neurodevelopmental therapy once a month for 6 months. These sessions also lasted for 1 hour and were supported by a similar home program.

The researcher was interested in *motor development*, as reflected in primitive reflexes (assessed according to a procedure described in the literature); postural reactions (measured by an instrument adapted from one described in the literature); gross motor ability (measured by the Wolanski Gross Motor Evaluation); fine motor skills (measured by Gesell and Amatruda's developmental screening inventory); infant development (measured by the Bayley Scales of Infant Development); abnormal movement (measured by an instrument developed especially for this study); and activities of daily living (specifically, feeding and dressing, measured on a 5-point scale). The researcher added each child's scores on the seven instruments to obtain an aggregate index of motor development. She the compared the average aggregate indexes of the groups before and after treatment.

What did the researcher find?

The intensive-treatment group "responded considerably better, on average," than the basic-treatment group, "taking into account the effects of the child's age, the mother's education and whether the child was born at term or earlier" (p. 264).

What do the findings mean?

- The findings suggest that young children with motor delay, including cerebral palsy, can benefit more from weekly neurodevelopmental therapy supported by a home program than from monthly neurodevelopmental therapy supported by a home program.
- The findings should boost confidence in funding programs that use intensive neurodevelopmental therapy with young children with motor delay.

What are the study's limitations?

- Study published 7 years after data was collected.
- Group differences reported (demographics and subject characteristics at baseline), but not subjected to statistical analysis to determine if groups were the same.
- Four subjects dropped out of trial before completing prescribed regimen, yet scores were left in so as not to decrease the t statistic.
- Many of the scoring methods (even on standardized evaluations) were modified for the purpose of the study.
- Treatment protocol not specified; fidelity not monitored.
- Power not reported.
- Parents' compliance with home program not measured.
- Generalization limited by child's age, diagnosis, and geographical area.
- Outcome measures were not studied individually, so clinical implications were lost.

■ 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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