

REVIEW OF EFFICACY OF NEURO DEVELOPMENTAL THERAPY BASED INTERVENTIONS ON IMPAIRMENT IN CHILDREN WITH CEREBRAL PALSY

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INTRODUCTION

Babies have an innate motivation to explore and navigate. This is aided by biomechanical and neuronal organisation which develops in tandem. The feedback in form of somatosensory experience arising from the repertoire is stored in the memory and used for learning and motor control.

Any insult during the developing brain prevents development which has serious consequences on acquisition of any of these mechanisms and hence directly affects the movement control and skills. However, impairments in children with CP are often accompanied by disturbances of sensation, perception, cognition, communication, and behaviour, by epilepsy, and secondary musculoskeletal problems which leads to dysfunctional movement control, and hence complicates the acquisition of skills in the developing brain.

Children with CP are unable to effectively use the strategies to organize movement skills due to impairments, which becomes evident when the baby shows gross motor development delay with lack of motor control in majority of trunk and lower extremities muscles along with mal alignment. The proponents of Neuro-developmental therapy (NDT) have favoured a holistic view which incorporates the view of addressing all the impairments which could negatively influence other Musculo-skeletal functions. This approach of treating the person has a whole was favoured by all rehabilitation professionals.

PURPOSE OF REVIEW

Even though the framework of NDT has changed, the therapy is too individualized this means that there is no specific technique delivered in an individualized manner. The results too are variable as children with CP are not only influenced by level of care, presence of enriched environment and family's support but also with presence of associated impairments like hearing, vision, perception and communication. The aim of this review is to elucidate efficacy of NDT by reviewing only those studies which have described the techniques as they are reproducible

METHODS & RESULTS

INCLUSION CRITERIA NDT based intervention and techniques described in detail	Electronic Database Search PubMed, PsycInfo	Search term categories ["NDT" OR Neurodevelopmental Therapy] AND Cerebral palsy
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The systematic search identified 49 studies from 814 studies
 RCT- 16
 Pre- post - 33

Participant Characteristics
 The age of participants ranged from ____ to ____.

Intervention Characteristics NDT as adjunct intervention - NDT as mainstay intervention -	NDT intervention explained - NDT Dosage -	NDT intervention explained - NDT Dosage -
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Impairment in ICF categories managed through intervention

Body structure and function Swallowing Balance / postural control / trunk control Spasticity Range of motion	Activity Limitation Gross motor function measure Feeding Quality of movement , walking Upper extremity function Dressing skills	Participation restriction Occupational performance
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DISCUSSION

The studies reviewed mostly consisted of heterogenous participants. Most of the studies lack details of techniques and instructions used to administer NDT based intervention. Therefore, there is weak evidence of NDT based interventions. There were only 2 RCTs which had detailed NDT intervention. The effects of NDT have been observed on postural tone, weight bearing and shifting, transitional movement, quality of movement in upper extremity. None of the studies could demonstrate changes in movement time and reaction time suggesting that NDT did not influence movement planning.

The dosage methodology for movement intervention used in neuro-rehabilitation and motor learning like Whole vs part, blocked vs random has not been mentioned in any of the studies. This limits the utility of NDT based intervention in observing changes in functional improvements and skill transfer to other activities. Improvements in outcomes like COPM and Goal attainment score was found only in participants who could participate in at least 70 % of the intensive programme.

Most of the pre-post studies spanning over 1 year in duration without control group have reported change in balance, walking pattern, strength, gross motor function. This may be due to effect of maturation of nervous system with time. RCTs where NDT has been used as adjunct with other interventions have shown significant improvement .

Conclusion: NDT in combination with other interventions is able to significant improvement in impairments