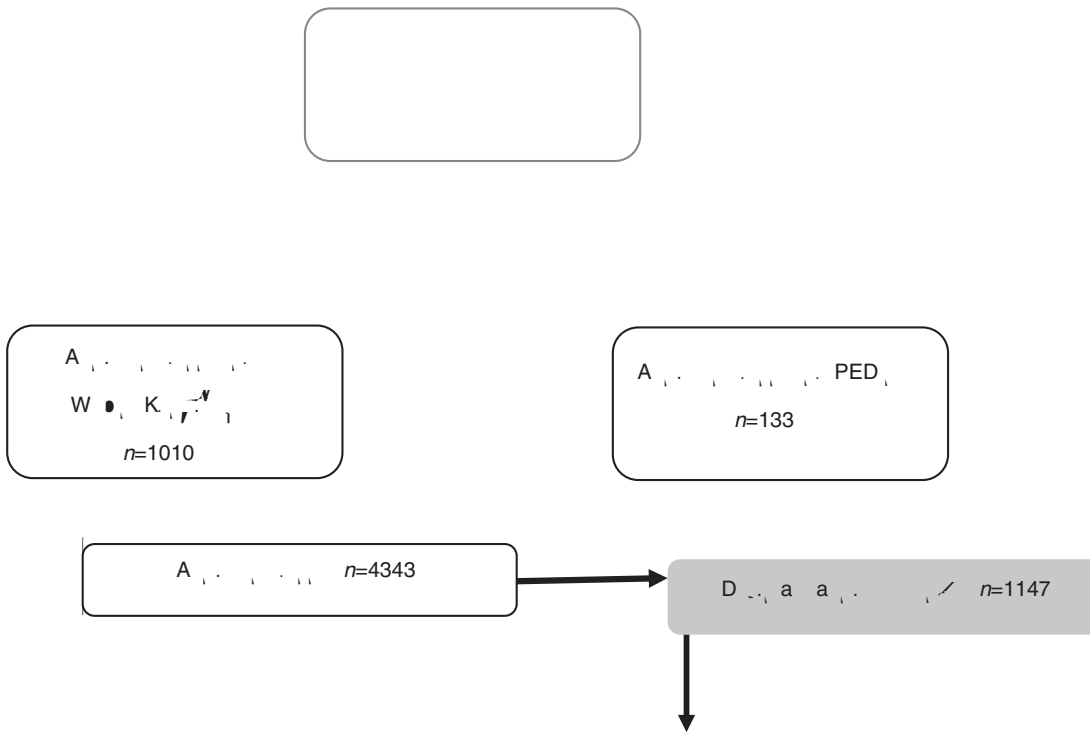


domains. Motor interventions targeting fine and gross motor skills are often initiated for infants at risk of, or diagnosed with, CP.

online supporting information). Authors were contacted for additional information as necessary for complete and



used the Pediatric Evaluation of Disability Inventory to evaluate child functional ability.

Measures of contextual factors were included in four studies.^{27,30,32,33} Two studies^{27,32} assessed the quality of the home environment using the Home Observation Measurement of the Environment, and three^{30,32,33} assessed aspects of parent well-being including measures of

stress and anxiety. Only one study²⁷ assessed adaptive behaviour and used the Vineland Scales for this purpose.

Effects of intervention: motor: The level II studies were considered too heterogeneous to combine into a meta-analysis. There were four studies^{26,32,34,36} that reported statistically significant between-group differences in motor outcomes at the end of the intervention period

Table 1: Characteristics of the studies

ICF	Body structure/function		Body structure/function/activity			Activity		Participation		Context	
	Inhibit abnormal movement pattern	Facilitate normal movement pattern	Physical guidance	Child-initiated movement	Task-specific training	Developmental progression	Motor exploration/variability	Parent education	Environment modification	Social scaffolding	
Therapeutic component											
Level II and III studies											
CAMS ³⁰				✓	✓	✓		✓			
COPCA ^{24,25}					✓	✓	✓	✓			
Developmental skills ³⁶					✓	✓		✓			
EIP (NBAS+NDT) ³³	✓	✓	✓						✓		
E-stim+NDT ³⁴	✓	✓	✓							✓	
GAME ³²				✓	✓		✓	✓	✓	✓	✓
Kicking+treadmill ³¹				✓	✓			✓	✓	✓	✓
<i>Lea i game</i> ^{26,27}				✓	✓	✓		✓	✓	✓	✓
NDT ^{24-26,28,29,34-36}	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
NFDR ³⁶	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
Level IV studies											
Casting: weight bearing ^{41,47}	✓	✓	✓			✓					
CIMT ^{37,38,42-44}				✓	✓	✓	✓	✓	✓	✓	✓
Mobility training ⁴⁵				✓	✓	✓	✓	✓	✓	✓	✓
NDT ^{41,47,48}	✓	✓	✓	✓	✓	✓					
Neurobehavioural intervention ³⁹		✓	✓			✓					
Physiotherapy ⁴⁹		✓	✓			✓					
Treadmill ⁴⁶		✓	✓			✓					
Vojta ⁴⁰	✓	✓	✓			✓					

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(Table SIII). Two of the studies were scored as low quality,^{34,36} and two were of moderate to high quality.^{26,32} (Appendix S4 contains individual quality scores for each study). Effect size ranged from 0.14 (small) to 0.75 (moderate to high). A positive effect size was demonstrated for the comparison group in three studies,^{24,26,30} and a positive effect size for the experimental group in five studies.^{29,31–34}

Effects of intervention on non-motor outcomes: Five studies^{25,26,29,30,33} measured cognitive outcomes but only the study by Palmer et al.²⁶ demonstrated significant between-group differences in favour of the Learninggames intervention after 6 months. Parent well-being outcomes were assessed in three studies, with only one study demonstrating benefit of the early intervention programme on parent anxiety and confidence.³³ One study found a short-term benefit of the early intervention programme on the quality of mother–infant interaction during feeding.³⁰

Level IV a d V i cluded Studie

The 13 level IV studies included three cohort and 10 single-subject designs. There was a total of 130 participants, ranging in age from 5 to 24 months. The most common intervention, used in five studies, was constraint-induced movement therapy (CIMT),^{37,38,42–44} followed by three studies that used NDT,^{41,47,48} one that used the Vojta approach,⁴⁰ one treadmill training,⁴⁶ one mobility training,⁴⁵ one a developmental programme,³⁹ and one intensive 'physiotherapy' defined as an eclectic mix of concepts.⁴⁹

All studies reported positive results (Table SII), with the exception of Kinghorn and Roberts,⁴¹ but causal

l e e 2

Intervention approaches varied among the studies, even when the interventions were derived from the same conceptual framework. For example, seven studies^{24,26,28,29,34–36} included NDT as either the experimental or control intervention, but the descriptions of the actual therapeutic components used in the studies varied (Table I). The challenge of a uniform definition of NDT has been identified previously⁶⁵ and complicates interpretation of its effectiveness. It also highlights the limitations of using acronyms such as NDT to describe an intervention without a detailed description of the intervention itself. Interventions need to be clearly described using contemporary terminology, and to include a theoretical or conceptual framework, and a description of the key ingredients of the approach that differentiate it from other interventions.

Most interventions in this body of research were not described in enough detail to ensure accurate replication in future research. Treatment frequency and duration were reported for all experimental interventions, but were absent for the comparison intervention in four studies.^{29–31,34} The terms 'standard care' or 'usual care' were used to define the control intervention in four studies,^{30–33} however, like NDT, components of 'standard care' and 'usual care' varied considerably among the studies and were often not described in enough detail to allow replication by other researchers.

Table I identifies the underlying components of the interventions described in the studies in this review. The two studies^{26,32}

considering the documented success of these types of intervention with older children

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