



## EVIDENCE SEARCH RESULTS

<b>Question/subject of request:</b>	<p>I am currently looking at evidence for early intervention for children with complex needs/ physical disabilities/high risk infants. From an early intervention perspective I am primarily focusing on under 5's, especially those within the first 1001 days.</p> <p>I have managed to find a good number of articles surrounding the 'theory' of early intervention, but fewer on what this would look like practically with examples of early intervention. Most models seem to be more 'disease specific' (such as cerebral palsy) and have small sample sizes. I have found some international trials, but have struggled to find many examples in the UK.</p> <p>Its would be great to have a more detailed search to try to especially find some more practical examples of early intervention models for infants.</p>
<b>Date requested:</b>	18/3/2025
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<b>Compiled by:</b>	Roxanne Hart

### CITING THIS SEARCH

If you reference this search in any paper, publication or presentation, please let us know.

The citation format is:

- Hart, R., (2025). *Evidence summary: early intervention complex needs*. Taunton, UK: Somerset Foundation Trust Knowledge and Library Services.

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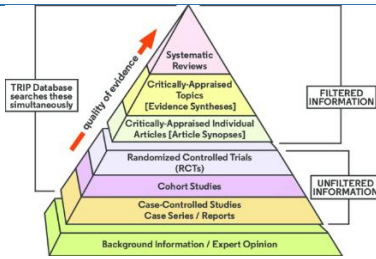
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## **SR and meta analysis**

**Bernabe-Zuniga, J. E., Rodriguez-Lucenilla, M. I., Alias-Castillo, A. J., Rueda-Ruzafa, L., Roman, P., & Del Mar Sanchez-Joya, M. (2025). [Early interventions with parental participation and their implications on the neurodevelopment of premature children: A systematic review and meta-analysis](#). *European Child & Adolescent Psychiatry*, 34(3), 853–865.**

The occurrence of preterm birth is correlated with the potential emergence of disabilities in children. Early intervention programs are designed to promote better developmental outcomes. These interventions employ family-centered methodologies, wherein parents are instructed to facilitate neurodevelopment, thereby promoting heightened involvement of the child in their daily activities. The objective of this investigation was to evaluate the efficacy of early family-based interventions on motor, cognitive, and language development. A systematic review and meta-analysis was conducted. Early motor interventions that emphasize parent involvement and education in neurodevelopment show significant outcomes in motor and cognitive areas at 2 years of age in very premature or extremely premature infants. However, inconclusive effects have been found in the language area, which is the least studied domain. Due to the methodological heterogeneity observed, further research is needed to establish conclusive decisions regarding the administration of these interventions and the determination of key evaluation periods.

**Shin, Y., Park, E. J., & Lee, A. (2025). [Early intervention for children with developmental disabilities and their families via telehealth: Systematic review](#). *Journal of Medical Internet Research*, 27, e66442.**

**BACKGROUND:** Early intervention during the first 3 years of life is crucial for children with developmental disabilities to optimize developmental outcomes. However, access to such services is often limited by geographical distance and resource constraints. Telehealth can be part of a solution for overcoming these barriers, enabling the delivery of early intervention



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services. However, a comprehensive understanding of the efficacy and implementation of telehealth in early interventions remains elusive, particularly for children aged 0-3 years. **OBJECTIVE:** This systematic review aims to synthesize existing research on the effectiveness and implementation of telehealth interventions in infants and toddlers (aged 0-3 years) who are at risk of or diagnosed with developmental disabilities. The primary objective of the study is to evaluate the ways that telehealth compares to conventional in-person interventions in improving developmental outcomes for children and supporting family well-being. **METHODS:** A systematic search was conducted of 4 electronic databases (PubMed, Embase, CINAHL, and Web of Science), focusing on studies published between 2010 and 2024. The inclusion criteria were studies involving telehealth interventions for children aged 0-3 years who were at high risk or had developmental disabilities, which involved active interactions between the providers and the families. Study quality was assessed using the mixed methods appraisal tool, and a narrative synthesis was used to analyze the data. **RESULTS:** Eighteen studies met the inclusion criteria: 12 single-case designs, 4 randomized controlled trials, and 2 nonequivalent control group designs. All studies involved caregiver-child dyads, with child ages ranging from 5 to 37 months and having or at risk of autistic spectrum disorder (n=10, 56%), cerebral palsy (n=4, 22%), and other conditions (n=4, 22%). Synchronous videoconferencing was the primary modality for caregiver training and coaching (n=17, 94%) while 1 intervention used an Internet of Things system. Outcomes were identified in child communication (n=9, 50%), physical (n=6, 33%), social or emotional (n=6, 33%), and adaptive behavior (n=4, 22%), as well as caregiver implementation (n=12, 66%). Telehealth demonstrated comparable or superior effectiveness to traditional in-person methods in 2 studies. However, the focus on specific conditions and limited research on cognitive development were notable gaps. **CONCLUSIONS:** Telehealth can be a viable alternative to traditional in-person early interventions for young children who have developmental disabilities and their families. It enhances accessibility and interactions between families and providers at a distance while promoting family-centered care. Challenges exist, including those of technological literacy, and the lack of research on cognitive outcomes must be addressed. Future work should explore more comprehensive interventions, including multidisciplinary approaches and expanded family outcomes, to solidify the role that telehealth plays in early intervention.

**Smythe, T., Scherer, N., Nanyunja, C., Tann, C. J., & Olusanya, B. O. (2024). [Strategies for addressing the needs of children with or at risk of developmental disabilities in early childhood by 2030: a systematic umbrella review](#). *BMC medicine*, 22(1), 51.**

**Background** There are over 53million children worldwide under five with developmental disabilities who require effective interventions to support their health and well-being. However, challenges in delivering interventions persist due to various barriers, particularly in low-income and middle-income countries. **Methods** We conducted a global systematic umbrella review to assess the evidence on prevention, early detection and rehabilitation interventions for child functioning outcomes related to developmental disabilities in children under 5 years. We focused on prevalent disabilities worldwide and identified evidence-based interventions. We searched Medline, Embase, PsychINFO, and Cochrane Library for relevant literature from 1st January 2013 to 14th April 2023. A narrative synthesis approach was used to summarise the findings of the included meta-analyses. The results were presented descriptively, including study characteristics, interventions assessed, and outcomes reported. Further, as part of a secondary analysis, we presented the global prevalence of each disability in 2019 from the Global Burden of Disease study, identified the regions with the highest burden and the top ten affected countries. This study is registered with PROSPERO, number CRD42023420099. **Results** We included 18 reviews from 883 citations, which included 1,273,444 children under five with or at risk of developmental disabilities from 251 studies across 30 countries. The conditions with adequate data were cerebral palsy, hearing loss, cognitive impairment, autism spectrum





disorder (ASD) and attention-deficit/hyperactivity disorder. ASD was the most prevalent target disability (n=8 reviews, 44%). Most reviews (n=12, 67%) evaluated early interventions to support behavioural functioning and motor impairment. Only 33% (n=10/30) of studies in the reviews were from middle-income countries, with no studies from low-income countries. Regarding quality, half of reviews were scored as high confidence (n=9/18, 50%), seven as moderate (39%) and two (11%) as low. Conclusions We identified geographical and disability-related inequities. There is a lack of evidence from outside high-income settings. The study underscores gaps in evidence concerning prevention, identification and intervention, revealing a stark mismatch between the

**Dumuids-Vernet, M., Provasi, J., Anderson, D., & Barbu-Roth, M. (2022). [Effects of Early Motor Interventions on Gross Motor and Locomotor Development for Infants at-Risk of Motor Delay: A Systematic Review](#). *Frontiers in Pediatrics*, 10.**

**Aim:** To systematically examine the effect of early motor interventions on motor and locomotor development in infants <1 year of age with motor developmental disability or at risk of motor delay.

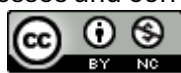
**Methods:** Pertinent literature from January 2000 to September 2021 was identified by searching the PubMed, Embase, Cochrane, Pedro and Web of Science databases. Selection criteria included interventions starting before 12 months corrected age. Methodological quality was assessed with AACPD criteria, Mallen score and Cochrane risk of bias methodology. Evaluation procedure was performed using PRISMA protocol (PICO approach) and AMSTAR-2. This review was preregistered in PROSPERO (CRD42021286445).

**Results:** Ten articles met the inclusion criteria; seven had moderate to strong methodological quality. The interventions included treadmill training (n = 3), crawling training (n = 1), "tummy time" (n = 1), physical therapy with neonatal developmental program (n = 1) or Bobath approach (n = 1), treadmill training combined with active leg movements (n = 2) or Bobath physiotherapy (n = 1). The three key characteristics of effective interventions that emerged from the review were: (1) the infants' disability or risk of delay was well-defined; (2) the protocol was standardized and easy to replicate; (3) infants were required to make active movements.

**Conclusion:** There is an urgent need for additional high-quality studies on the effects of early motor interventions on the gross motor and locomotor development of infants with a range of disabilities or risks for delay. Suggestions for future research are outlined.

**McCarthy, E., & Guerin, S. (2022). [Family-centred care in early intervention: A systematic review of the processes and outcomes of family-centred care and impacting factors](#). *Child: Care, Health & Development*, 48(1), 1–32.**

Family-centred care (FCC) has been established as a best practice model for child disability services internationally. However, further empirical support is required to explore the operationalization and efficacy of FCC, in the absence of a universal practice model. This review aimed to identify the key processes and outcomes of FCC in early intervention (EI) settings and the factors that impact FCC. A systemic review was conducted exploring the processes and outcomes of FCC delivered to children predominantly aged 0-6 years with disabilities/suspected disabilities and families as part of EI or early services. The search procedure was informed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al., 2009). Narrative analysis of data was guided by Braun and Clarke (2006, 2014). Data were presented as per the standards for reporting qualitative research (SRQR; O'Brien et al., 2014). Forty-two studies were included. The majority (90.5%) outlined the processes of FCC, with 59.5% of studies detailing outcomes. Processes were largely reported as qualitative data and/or subscales of the Measure of Processes of Care (MPOC; King et al., 1995), which were subsequently collated. Findings indicated eight key operational processes and corresponding outcomes. Variables that hinder or facilitate FCC





included family/professional characteristics, family/service resources, and parent attitudes, engagement and agency. FCC was largely conceptualized as the application of services to children and their families. Critical perspectives on FCC are discussed. It is hoped this research will contribute to the development of a framework of FCC in EI to inform services provided to young children with complex needs and their families and future research.

**Damiano, D. L., & Longo, E. (2021).** [Early intervention evidence for infants with or at risk for cerebral palsy: An overview of systematic reviews.](#) *Developmental Medicine & Child Neurology*, 63(7), 771–784.

**AIM:** To perform an overview of systematic reviews and more recent randomized controlled trials (RCTs) on early motor interventions in infants aged 0 to 3 years with or at risk of cerebral palsy to inform current clinical and research efforts and provide a benchmark to assess future interventions ideally initiated within the first 6 months. **METHOD:** Standardized searches of the PubMed, Embase, Scopus, and Web of Science databases were conducted for systematic reviews (2009-2020) and RCTs (2015-2020). **RESULTS:** From 840 unique records, 31 full texts were reviewed, yielding three systematic reviews encompassing 46 studies, 16 with comparison groups, and six additional RCTs that met the criteria. Two enrichment- and activity-based approaches had medium effect sizes on motor development, only one with low risk of bias; two others had large task-specific effect sizes but some bias concerns; and three enriched environment studies with some bias concerns had medium effect sizes on cognitive development. Most had small or no effect sizes, bias concerns, and uncertain diagnostic determinations. **INTERPRETATION:** Data synthesis revealed limited data quantity and quality, and suggest, although not yet confirmed, greater benefit from early versus later intervention. Research efforts with greater early diagnostic precision and earlier intervention are accelerating, which may transform future outcomes and practices. What this paper adds For over 50% of trials within the reviews, the intervention was compared to standard care with only two showing efficacy. Similar to results in older children, constraint-induced movement therapy (CIMT) emerged as efficacious with high effect sizes. CIMT was not superior to similarly intense bimanual training or occupational therapy. Goals-Activity-Motor Enrichment intervention initiated before 5 months of age was superior to equally intense standard care. Several other enriched environment strategies promoted cognitive and/or motor development.

**Ward, R., Reynolds, J. E., Pieterse, B., Elliott, C., Boyd, R., & Miller, L. (2020).** [Utilisation of coaching practices in early interventions in children at risk of developmental disability/delay: A systematic review.](#) *Disability & Rehabilitation*, 42(20), 2846–2867.

**Background:** To conduct a systematic review of early intervention programs (0-5 years) utilising coaching practice characteristics, to identify (i) implementation fidelity; (ii) parent training processes, and (iii) outcome measures of capacity building in parents. The coaching practice characteristics of (1) joint planning, (2) observation, (3) action/practice, (4) reflection and (5) feedback identified by Rush and Shelden were utilised. **Method:** The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement was followed. A comprehensive search of 6 electronic databases was undertaken in March 2016 and updated in February 2018. **Results:** Of 2397 articles, 18 papers met full inclusion criteria. Of these, 5 were randomised controlled trials. Only one specifically evaluated the impact of parent coaching versus therapist only delivered interventions. Risk of bias and study quality using Downs and Black checklist for clinical trial quality yielded the following descriptive ratings: Seven studies: "Poor" (scores 1-13); Six studies: "Fair" (scores 15-17); and five "Good" (scores 20-24). **Conclusion:** Coaching in early intervention is well accepted. Nevertheless, this review identified a continued lack of operationalised definitions; inconsistency in the reporting of therapist training and adherence to active ingredients/coaching principles; and an absence of outcome measures focused on parent capacity. Implications for Rehabilitation Contemporary





early intervention services recognise the importance of engaging parents as active participators in their child's development. This is evident by the increase in interventions that utilise parent coaching practices. The findings of this systematic review indicate the need for professionals to:

- \*Describe and document fidelity of coaching practices in the delivery of intervention.
- \*Objectively measure changes in parent capacity and self-efficacy as a result of the coaching based intervention.

The reporting of parent capacity measures will allow us to truly examine the effectiveness of coaching practices in empowering families to support their child to realise their full potential.

**Novak, I., & Honan, I. (2019). [Effectiveness of paediatric occupational therapy for children with disabilities: A systematic review](#). *Australian Occupational Therapy Journal*, 66(3), 258–273.**

**INTRODUCTION:** Paediatric occupational therapy seeks to improve children's engagement and participation in life roles. A wide variety of intervention approaches exist. Our aim was to summarise the best-available intervention evidence for children with disabilities, to assist families and therapists choose effective care. **METHODS:** We conducted a systematic review (SR) using the Cochrane methodology, and reported findings according to PRISMA. CINAHL, Cochrane Library, MEDLINE, OTSeeker, PEDro, PsycINFO were searched. Two independent reviewers: (i) determined whether studies met inclusion: SR or randomised controlled trial (RCT); an occupational therapy intervention for children with a disability; (ii) categorised interventions based on name, core components and diagnostic population; (iii) rated quality of evidence and determined the strength of recommendation using GRADE criteria; and (iv) made recommendations using the Evidence Alert Traffic Light System. **RESULTS:** 129 articles met inclusion (n = 75 (58%) SRs; n = 54 (42%) RCTs, measuring the effectiveness of 52 interventions, across 22 diagnoses, enabling analysis of 135 intervention indications. Thirty percent of the indications assessed (n = 40/135) were graded 'do it' (Green Go); 56% (75/135) 'probably do it' (Yellow Measure); 10% (n = 14/135) 'probably don't do it' (Yellow Measure); and 4% (n = 6/135) 'don't do it' (Red Stop). Green lights were: Behavioural Interventions; Bimanual; Coaching; Cognitive Cog-Fun & CAPS; CO-OP; CIMT; CIMT plus Bimanual; Context-Focused; Ditto; Early Intervention (ABA, Developmental Care); Family Centred Care; Feeding interventions; Goal Directed Training; Handwriting Task-Specific Practice; Home Programs; Joint Attention; Mental Health Interventions; occupational therapy after toxin; Kinesiotape; Pain Management; Parent Education; PECS; Positioning; Pressure Care; Social Skills Training; Treadmill Training and Weight Loss 'Mighty Moves'. **CONCLUSION:** Evidence supports 40 intervention indications, with the greatest number at the activities-level of the International Classification of Function. Yellow light interventions should be accompanied by a sensitive outcome measure to monitor progress and red light interventions could be discontinued because effective alternatives existed.

**Benzies, K. M., Magill-Evans, J. E., Hayden, K. A., & Ballantyne, M. (2013). [Key components of early intervention programs for preterm infants and their parents: A systematic review and meta-analysis](#). *BMC Pregnancy & Childbirth*, 13(Suppl 1), S10.**

**BACKGROUND:** Preterm infants are at greater risk for neurodevelopmental disabilities than full term infants. Interventions supporting parents to improve the quality of the infant's environment should improve developmental outcomes for preterm infants. Many interventions that involve parents do not measure parental change, nor is it clear which intervention components are associated with improved parental outcomes. The aim of this review was to categorize the key components of early intervention programs and determine the direct effects of components on parents, as well as their preterm infants. **METHODS:** MEDLINE, EMBASE, CINAHL, ERIC, and Cochrane Database of Systematic Reviews were searched between 1990 and December 2011. Eligible randomized controlled trials (RCTs) included an early intervention for preterm infants, involved parents, and had a community component. Of 2465 titles and abstracts identified, 254





full text articles were screened, and 18 met inclusion criteria. Eleven of these studies reported maternal outcomes of stress, anxiety, depressive symptoms, self-efficacy, and sensitivity/responsiveness in interactions with the infant. Meta-analyses using a random effects model were conducted with these 11 studies. **RESULTS:** Interventions employed multiple components categorized as (a) psychosocial support, (b) parent education, and/or (c) therapeutic developmental interventions targeting the infant. All interventions used some form of parenting education. The reporting quality of most trials was adequate, and the risk of bias was low based on the Cochrane Collaboration tool. Meta-analyses demonstrated limited effects of interventions on maternal stress ( $Z = 0.40$ ,  $p = 0.69$ ) and sensitivity/responsiveness ( $Z = 1.84$ ,  $p = 0.07$ ). There were positive pooled effects of interventions on maternal anxiety ( $Z = 2.54$ ,  $p = 0.01$ ), depressive symptoms ( $Z = 4.04$ ,  $p = 0.01$ ). **CONCLUSIONS:** Positive and clinically meaningful effects of early interventions were seen in some psychosocial aspects of mothers of preterm infants. This review was limited by the heterogeneity of outcome measures and inadequate reporting of statistics. **IMPLICATIONS OF KEY FINDINGS:** Interventions for preterm infants and their mothers should consider including psychosocial support for mothers. If the intervention involves mothers, outcomes for both mothers and preterm infants should be measured to better understand the mechanisms for change.

**Case-Smith, J. (2013). [Systematic review of interventions to promote social-emotional development in young children with or at risk for disability](#). *American Journal of Occupational Therapy*, 67(4), 395–404.**

This systematic review synthesized the research on interventions used by occupational therapy practitioners to promote social-emotional development in young children (birth-5 yr) with or at risk for disabilities. After a comprehensive search of the research literature, 23 studies were reviewed and then synthesized into five themes: (1) touch-based interventions to enhance calming and parent-infant bonding, (2) relationship-based interventions to promote positive caregiver-child interactions, (3) joint attention interventions, (4) naturalistic preschool interventions to promote peer-to-peer engagement, and (5) instruction-based interventions to teach children appropriate social behaviors. The interventions for infants primarily involved coaching parents in specific strategies to promote positive interactions; interventions for preschool-age children typically involved encouraging peer support, instructing children, and applying naturalistic behavioral techniques to develop higher-level social competence. The studies demonstrated low to moderate positive effects for interventions used by occupational therapy practitioners to improve social-emotional development across ages, diagnoses, and settings.

**Frolek Clark, G. J., & Schlabach, T. L. (2013). [Systematic review of occupational therapy interventions to improve cognitive development in children ages birth-5 years](#). *American Journal of Occupational Therapy*, 67(4), 425–430.**

This systematic review examined the research evidence for interventions used by occupational therapists to improve cognitive development in children from birth to age 5. Thirteen studies met the inclusion criteria and were reviewed by three teams of two people. From the selected articles, which described Level I and IV studies, two general categories emerged: (1) developmental interventions and (2) joint attention interventions. Developmental interventions





occurred in neonatal intensive care units, home, child care centers, and preschools. Synthesis of the articles indicates that developmental interventions result in gains in early cognitive development (e.g., infant and preschool age) with inconclusive evidence for gains through school age. Educating parents of preterm infants to be more sensitive to their child's needs and more responsive in interactions increased cognitive outcomes and joint attention. Interventions using joint attention enhanced generalization to novel situations and increased play, language, and social interactions in preschoolers with autism. Further studies that describe intervention strategies used to enhance cognitive functioning to promote preliteracy skills such as joint attention, imitation, memory, problem solving, and decision making and are conducted by occupational therapists are needed.

**Ziviani, J., Feeney, R., Rodger, S., & Watter, P. (2010). [Systematic review of early intervention programmes for children from birth to nine years who have a physical disability](#). *Australian Occupational Therapy Journal*, 57(4), 210–223.**

**AIM:** To systematically review the literature on the effectiveness of early intervention programmes for children with physical disabilities. **METHODS:** Twelve electronic databases were searched for articles published between 1990 and April 2008. The quality of articles was appraised using an adapted version of the Checklist for the Evaluation of Research Articles and the Physiotherapy Evidence Database (PEDro) scale. **RESULTS:** Ten studies were included in the review. Cross-sectional and interrupted time-series studies were of moderate methodological quality, whereas the non-randomised control trial was of moderate-to-high methodological quality. Studies differed considerably with respect to participants, types of intervention and outcomes measured. **CONCLUSIONS:** Positive outcomes for both children and families have resulted from early intervention. However, methodological limitations hamper a more rigorous analysis of findings across studies.

#### **Review articles**

**Charcosset C., & Collet, M. (2025). [Effects of early intervention on premature development, motor performance and parental well-being: A narrative review](#). *Kinesithérapie*, (pagination), Date of Publication: 2025.**

Background: Advances in neonatal care have improved the survival of premature infant, but surviving babies are at risk of developmental, cognitive and motor delays. Prematurity can also affect families. Early intervention, as opposed to routine medical care, could improve the development of premature babies and contribute to the well-being of parents.

**De Campos, A. C., Hidalgo-Robles, A., Longo, E., Shrader, C., & Paleg, G. (2024). [F-words and early intervention ingredients for non-ambulant children with cerebral palsy: A scoping review](#). *Developmental Medicine & Child Neurology*, 66(1), 41–51.**

**AIM:** To explore the ingredients of early interventions provided to young children with cerebral palsy (CP) who are classified in Gross Motor Function Classification System (GMFCS) levels IV and V, and to identify the 'F-words' addressed by the interventions. **METHOD:** Searches were completed in four electronic databases. Inclusion criteria were the original experimental studies that fitted the following PCC components: population, young children (aged 0-5 years, at least 30% of the sample) with CP and significant motor impairment (GMFCS levels IV or V, at least 30% of the sample); concept, non-surgical and non-pharmacological early intervention services measuring outcomes from any of the International Classification of Functioning, Disability and Health domains; and context, studies published from 2001 to 2021, from all settings and not limited to any specific geographical location. **RESULTS:** Eighty-seven papers were included for review, with qualitative (n = 3), mixed-methods (n = 4), quantitative descriptive (n = 22), quantitative non-randomized (n = 39), and quantitative randomized (n = 19) designs. Fitness (n = 59), family (n = 46), and functioning (n = 33) ingredients were addressed by most





experimental studies, whereas studies on fun (n = 6), friends (n = 5), and future (n = 14) were scarce. Several other factors (n = 55) related to the environment, for example, service provision, professional training, therapy dose, and environmental modifications, were also relevant. **INTERPRETATION:** Many studies positively supported formal parent training and use of assistive technology to promote several F-words. A menu of intervention ingredients was provided, with suggestions for future research, to incorporate them into a real context within the family and clinical practice. **WHAT THIS PAPER ADDS:** Family-centred care (including coaching and caregiver-delivered interventions) and formal parental training are effective strategies for children in GMFCS levels IV and V. Assistive technology ingredients (power, mobility, supported, sitting, stepping, and standing) may promote several 'F-words' (functioning, fitness, family, fun, friends, and future). The lowest level of evidence was found for fun, friends, and future. Other factors (service provision, professional training, therapy dose, environmental modifications) are relevant for young children in GMFCS levels IV and V.

**Hutchon, B., Gibbs, D., Harniess, P., Jary, S., Crossley, S. L., Moffat, J. V., ... & Basu, A. P. (2019).** [Early intervention programmes for infants at high risk of atypical neurodevelopmental outcome.](#) *Developmental Medicine & Child Neurology*, 61(12), 1362-1367.

The purpose of this review is to present a new framework, EI SMART (early intervention: sensorimotor development, attention and regulation, relationships, and therapist support) for identifying key components that could contribute to more effective interventions for infants at high risk of atypical neurodevelopmental outcome. We present a clinical consensus of current challenges and themes in early intervention, based on multidisciplinary group discussions, including parents of high-risk infants, supported by a literature review. Components to include in early intervention programmes are: (1) promotion of self-initiated, developmentally appropriate motor activity; (2) supporting infant self-regulation and the development of positive parent–infant relationships; and (3) promotion of early communication skills, parent coaching, responsive parenting, and supporting parental mental well-being. Such multimodal programmes may need to be evaluated as a package

**McCarthy, M., Leigh, G., & Arthur-Kelly, M. (2019).** [Telepractice delivery of family-centred early intervention for children who are deaf or hard of hearing: A scoping review.](#) *Journal of Telemedicine & Telecare*, 25(4), 249–260.

**INTRODUCTION:** The use of telepractice, a method of delivering services through telecommunications technologies that provides two-way, synchronous audio and video signals in real-time, is becoming increasingly commonplace in early childhood education and intervention for children who are deaf or hard of hearing. Although the use of telepractice has been validated in the health sector as a viable and effective alternative to in-person service provision, evidence to support its use in the delivery of family-centred early intervention is still emerging. The purpose of this scoping review was to describe the current use of telepractice in the delivery of family-centred early childhood intervention for children who are deaf or hard of hearing, and their families. **METHOD:** The review followed the framework outlined by the Joanna Briggs Institute (2015), including an iterative three-step search strategy. Specific inclusion criteria and data extraction fields were outlined in advance. **RESULTS:** A total of 23 peer-reviewed publications were included in the review. Most publications (70%) provided anecdotal evidence of the challenges and benefits associated with telepractice. The remaining publications (30%) reported on research studies evaluating the effectiveness of early intervention delivered through telepractice. Of the 23 included papers, 18 viewed the use of telepractice positively while the remaining 5 reported mixed conclusions and the need for more data. **DISCUSSION:** Current evidence in the literature indicates that telepractice can be an effective model for delivering family-centred early intervention for children who are deaf or hard





of hearing. However, more research is needed to substantiate the use of telepractice as a viable alternative to traditional in-person services, rather than being seen as supplemental to such services.

**Kingsley, K., & Mailloux, Z. (2013). [Evidence for the effectiveness of different service delivery models in early intervention services](#). *American Journal of Occupational Therapy*, 67(4), 431–436.**

Consideration of the evidence for all aspects of service delivery is a growing relevant concern of occupational therapists, including those providing early intervention to children and families. We conducted a review of the literature to uncover what evidence existed for determining the effectiveness of different service delivery models and methods used to improve occupational performance for children and families who receive early intervention services. Through a comprehensive search, we reviewed and synthesized studies, finding common themes of family-centered and routine-based approaches, service setting, and the inclusion of parent participation and training. Families consistently reported positive perceptions of family-centered and routine-based approaches. Parent participation and training resulted in positive outcomes. No specific setting or method of service delivery was identified as clearly most effective, with most studies reporting combined approaches and environments for interventions.

#### **RCTs**

**Feldner, H. A., Logan, S. W., Otieno, S., Fragomeni, A., Kono, C., Riordan, K., . . . Kenyon, L. K. (2025). [Short-term powered mobility intervention is associated with improvements in development and participation for young children with cerebral palsy: A randomized clinical trial](#). *Physical Therapy*, 105(1)**

**OBJECTIVE:** The objective of this study was to evaluate the effects of 2 short-term powered mobility interventions across developmental domains, participation, and perceptions of intervention implementation for young children with cerebral palsy and their families. **CONCLUSION:** Short-term powered mobility intervention may advance multiple domains of development and participation for young children with cerebral palsy. Caregivers rated 2 different powered mobility devices favorably as part of their child's early intervention strategies. **IMPACT:** This study enhances the quality of evidence available to clinicians and families to support decision-making about powered mobility intervention for young children with motor disabilities, especially those who may be reluctant to begin powered mobility due to stigma or concern for motor skill development. **LAY SUMMARY:** In this study, children with cerebral palsy used 2 different powered mobility devices over 16 weeks. The goal of the study was to understand how powered mobility device use affected the children's movement, communication, learning, and social interactions. The goal was also to understand how caregivers felt about the intervention and device options.

**Pan C.Y., Tsai C.L., Chen F.C., Chen C.C., Hu Y.H., & Chu, C. H. (2025). [Effectiveness of a fundamental movement skill intervention in children with autism spectrum disorder: A randomized controlled trial](#). *Focus on Autism and Other Developmental Disabilities*, (pagination), Date of Publication: 2025.**

This study examined the effect of a 12-week fundamental movement skills (FMS) intervention on the motor skills of 20 boys with autism spectrum disorder (ASD) (ages 3-10 years) and whether the intervention effect would persist for at least 12 weeks after the intervention. In Part I, 10 boys with ASD (Group 1) received the intervention, whereas the remaining 10 boys with ASD (Group 2) did not (true control, no intervention). The arrangement was reversed in Part II. The main findings were that children in both the ASD groups exhibited significant improvements





in the overall gross motor development and the locomotor and object control subtest scores after the intervention. The effectiveness appeared to be sustained for at least 12 weeks in Group 1. The study findings indicate the importance of including FMS programming as a part of the early intervention services delivered to young children with ASD.

**Sakzewski L., Greaves S., Eliasson A.C., Wallen M., Novak I., Ware R.S., . . . Boyd, R. N. (2025).** [Early developmental trajectories of the impaired hand in infants with unilateral cerebral palsy.](#) *Developmental Medicine and Child Neurology*, (pagination), Date of Publication: 2025.

Aim: To identify developmental trajectories of impaired hand function in infants aged 3 to 15 months with unilateral cerebral palsy (CP).

**Benfer, K. A., Whittingham, K., Ware, R. S., Ghosh, A. K., Chowdhury, S., Moula, G., . . . Boyd, R. N. (2024).** [Efficacy of early intervention for infants with cerebral palsy in an LMIC: An RCT.](#) *Pediatrics*, 153(4)

**OBJECTIVE:** To test efficacy of a parent-delivered multidomain early intervention (Learning through Everyday Activities with Parents [LEAP-CP]) for infants with cerebral palsy (CP) compared with equal-dose of health advice (HA), on (1) infant development; and (2) caregiver mental health. It was hypothesized that infants receiving LEAP-CP would have better motor function, and caregivers better mental health. **METHODS:** This was a multisite single-blind randomized control trial of infants aged 12 to 40 weeks corrected age (CA) at risk for CP (General Movements or Hammersmith Infant Neurologic Examination). Both LEAP-CP and HA groups received 15 fortnightly home-visits by a peer trainer. LEAP-CP is a multidomain active goal-directed intervention. HA is based on Key Family Practices, World Health Organization. Primary outcomes: (1) infants at 18 months CA: Pediatric Evaluation of Disability Inventory-Computer Adaptive Test (PEDI-CAT mobility); and (2) caregiver: Depression Anxiety and Stress Scale. **RESULTS:** Of eligible infants, 153 of 165 (92.7%) were recruited (86 males, mean age 7.1+/-2.7 months CA, Gross Motor Function Classification System at 18 m CA: I = 12, II = 25, III = 9, IV = 18, V = 32). Final data were available for 118 (77.1%). Primary (PEDI-CAT mobility mean difference = 0.8 (95% CI -1.9 to 3.6) P = .54) and secondary outcomes were similar between-groups. Modified-Intention-To-Treat analysis on n = 96 infants with confirmed CP showed Gross Motor Function Classification System I and IIs allocated to LEAP-CP had significantly better scores on PEDI-CAT mobility domain (mean difference 4.0 (95% CI = 1.4 to 6.5), P = .003) compared with HA. **CONCLUSIONS:** Although there was no overall effect of LEAP-CP compared with dose-matched HA, LEAP-CP lead to superior improvements in motor skills in ambulant children with CP, consistent with what is known about targeted goal-directed training.

**Ondruskova, T., Royston, R., Absoud, M., Ambler, G., Qu, C., Barnes, J., . . . Hassiotis, A. (2024).** [Clinical and cost-effectiveness of an adapted intervention for preschoolers with moderate to severe intellectual disabilities displaying behaviours that challenge: The EPICC-ID RCT.](#) *Health Technology Assessment (Winchester, England)*, 28(6), 1–94.

Background: Stepping Stones Triple P is an adapted intervention for parents of young children with developmental disabilities who display behaviours that challenge, aiming at teaching positive parenting techniques and promoting a positive parent-child relationship. Objective: To evaluate the clinical and cost-effectiveness of level 4 Stepping Stones Triple P in reducing behaviours that challenge in children with moderate to severe intellectual disabilities. Design, setting, participants: A parallel two-arm pragmatic multisite single-blind randomised controlled trial recruited a total of 261 dyads (parent and child). The children were aged 30-59 months and had moderate to severe intellectual disabilities. Participants were randomised, using a 3 : 2 allocation ratio, into the intervention arm (Stepping Stones Triple P; n = 155) or treatment as usual arm (n = 106). Participants were recruited from four study sites in Blackpool, North and





South London and Newcastle. Intervention: Level 4 Stepping Stones Triple P consists of six group sessions and three individual phone or face-to-face contacts over 9 weeks. These were changed to remote sessions after 16 March 2020 due to the coronavirus disease 2019 pandemic. Main outcome measure: The primary outcome measure was the parent-reported Child Behaviour Checklist, which assesses the severity of behaviours that challenge. Results: We found a small non-significant difference in the mean Child Behaviour Checklist scores (-4.23, 95% CI -9.98 to 1.52,  $p = 0.146$ ) in the intervention arm compared to treatment as usual at 12 months. Per protocol and complier average causal effect sensitivity analyses, which took into consideration the number of sessions attended, showed the Child Behaviour Checklist mean score difference at 12 months was lower in the intervention arm by -10.77 (95% CI -19.12 to -2.42,  $p = 0.014$ ) and -11.53 (95% CI -26.97 to 3.91,  $p = 0.143$ ), respectively. The Child Behaviour Checklist mean score difference between participants who were recruited before and after the coronavirus disease 2019 pandemic was estimated as -7.12 (95% CI -13.44 to -0.81) and 7.61 (95% CI -5.43 to 20.64), respectively ( $p = 0.046$ ), suggesting that any effect pre-pandemic may have reversed during the pandemic. There were no differences in all secondary measures. Stepping Stones Triple P is probably value for money to deliver (-1057.88; 95% CI -3218.6 to -46.67), but decisions to roll this out as an alternative to existing parenting interventions or treatment as usual may be dependent on policymaker willingness to invest in early interventions to reduce behaviours that challenge. Parents reported the intervention boosted their confidence and skills, and the group format enabled them to learn from others and benefit from peer support. There were 20 serious adverse events reported during the study, but none were associated with the intervention. Limitations: There were low attendance rates in the Stepping Stones Triple P arm, as well as the coronavirus disease 2019-related challenges with recruitment and delivery of the intervention. Conclusions: Level 4 Stepping Stones Triple P did not reduce early onset behaviours that challenge in very young children with moderate to severe intellectual disabilities. However, there was an effect on child behaviours for those who received a sufficient dose of the intervention. There is a high probability of Stepping Stones Triple P being at least cost neutral and therefore worth considering as an early therapeutic option given the long-term consequences of behaviours that challenge on people and their social networks. Future work: Further research should investigate the implementation of parenting groups for behaviours that challenge in this population, as well as the optimal mode of delivery to maximise engagement and subsequent outcomes.

**Altunalan, T., Sari, Z., Dogan, T. D., Hacifazlioglu, N. E., Akman, I., Altintas, T., . . . Akcakaya, N. H. (2023). [Early developmental support for preterm infants based on exploratory behaviors: A parallel randomized controlled study](#). *Brain and Behavior*, *13*(11), e3266.**

**INTRODUCTION:** Preterm infants are at high risk for developmental disabilities, and their parents are at increased risk for high stress. Early intervention programs are applied to reduce these adverse outcomes. The primary aim is to compare the efficacy of the novel Explorer Baby early intervention program for the holistic development of preterm infants. The second objective was to compare the stress levels of their mothers. **METHODS:** Randomized clinical trial with 38 weeks-6 months corrected age preterm infants at low risk for cerebral palsy, randomly assigned to experimental (Explorer Baby) or active control neurodevelopmental therapy (NDT) groups. Fifty-seven infants were enrolled in the study, and 51 (26 Explorer Baby, 25 NDT) completed it. Bayley III was used as a primary outcome before, during, and after the intervention. **RESULTS:** When we compared the changes between the groups before and after therapy, no significant differences were found in any of the primary or secondary outcomes (between-group comparisons). When comparing the changes in both groups before and after therapy (in-group comparison), the Explorer Baby group demonstrated significant improvements in cognitive (Hedges'  $g = .83$ ) and explorative language skills (Hedges'  $g = .65$ ), whereas the NDT group showed improved parent-child dysfunctional interaction (Hedges'  $g = 2.66$ ) between T0-T1 and







improved over time in the COPCA-group. Family empowerment was positively associated with intervention elements, including "caregiver coaching." **Conclusions:** One year of COPCA or typical infant physiotherapy resulted in similar family and functional outcomes. Yet, specific intervention elements, e.g., coaching, may increase empowerment of families of very high risk infants and may influence quality of life, which emphasizes the importance of family centred services. Implications for rehabilitation One year of the family centred programme "Coping with and Caring for infants with special needs" compared with typical infant physiotherapy resulted in similar family outcome and similar functional outcome for the infants at very high risk for cerebral palsy. Specific contents of intervention, such as caregiver coaching, are associated with more family empowerment and increased quality of life. Emphasis on family needs is important in early intervention for infants at very high risk for cerebral palsy.

**Blauw-Hospers, C. H., Dirks, T., Hulshof, L. J., Bos, A. F., & Hadders-Algra, M. (2011). [Pediatric physical therapy in infancy: From nightmare to dream? A two-arm randomized trial](#). *Physical Therapy*, 91(9), 1323–1338.**

**BACKGROUND:** Systematic reviews have suggested that early intervention by means of specific motor training programs and general developmental programs in which parents learn how to promote infant development may be the most promising ways to promote infant motor and cognitive development of infants with or at high risk for developmental motor disorders. **OBJECTIVE:** The purpose of this study was to investigate the effects of a recently developed pediatric physical therapy intervention program ("Coping With and Caring for Infants With Special Needs" [COPCA]) on the development of infants at high risk for developmental disorders using a combined approach of a 2-arm randomized trial and process evaluation. **SETTING:** The study was conducted at the University Medical Center Groningen in the Netherlands. **PARTICIPANTS AND INTERVENTION:** Forty-six infants at high risk for developmental disorders were randomly assigned to receive COPCA (a family-centered program) (n=21) or traditional infant physical therapy (TIP) (n=25) between 3 to 6 months corrected age (CA). Developmental outcome was assessed by blinded assessors at 3, 6, and 18 months CA with a neurological examination, the Alberta Infant Motor Scales, the Pediatric Evaluation of Disability Inventory, and the Mental Developmental Index (MDI) of the Bayley Scales of Infant Development. Contents of the intervention were analyzed by a quantitative video analysis of therapy sessions. Quantified physical therapy actions were correlated to evaluate associations between intervention and developmental outcome components. **RESULTS:** The trial revealed that developmental outcome in both groups was largely identical. Process evaluation showed that typical COPCA actions-(1) family involvement and educational actions, (2) application of a wide variation in challenging the infant to produce motor behavior by himself or herself and allowing the infant to continue this activity, and (3) stimulation of motor behavior at the limit of the infant's capabilities-had positive correlations with developmental outcome at 18 months CA. The use of handling techniques was negatively associated with the Pediatric Evaluation of Disability Inventory outcome at 18 months CA. **LIMITATIONS:** Major limitations were the limited size of the groups studied and the differences between the groups in frequency and duration of physical therapy sessions. **CONCLUSION:** Extending the randomized trial with process evaluation was needed to obtain insight into associations between the components of intervention and developmental outcome. Specific therapist behaviors of parent coaching are associated with improved developmental outcome measures. Further studies are needed to examine whether these associations are caused by therapist behavior or whether therapist behavior is modified by children's motor skills.

### **Other study types**



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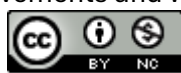


**Fernandes, M., Matuskova, O., Babelova, R., Santosa, W. B., Shaw, O., & Hrica, P. (2025). [A community-based intervention \(the omama project\) improves neurodevelopment in impoverished 2-year-old roma children: A quasi-experimental observational study. \*European Journal of Pediatrics\*, 184\(2\), 133.](#)**

High rates of childhood neurodisability are reported among the Roma, Europe's largest ethnic minority community. Interventions targeting early child development (ECD) during the first 2 years of life can improve neurodevelopmental outcomes in vulnerable children; however, evidence from Roma preschoolers is scarce. In a quasi-experimental observational study, we compared neurodevelopmental outcomes at age 2 years, measured on the INTERGROWTH-21st Project Neurodevelopmental Assessment (INTER-NDA), between Roma children receiving a community-based ECD intervention (RI, n = 98), and age- and sex-matched Roma and non-Roma children (RC, n = 99 and NRC, n = 54, respectively) who did not receive the intervention in Eastern Slovakia. The intervention was delivered between 3 weeks and 20 months in weekly home-based sessions by trained Roma women from matched settlements to RIs. Compared with RC, RI had higher 2-year cognitive (B = 0.15; 95% CI, 0.04, 0.25), language (B = 0.25; 95% CI, 0.11, 0.38) and fine motor (B = 0.08; 95% CI, 0.01, 0.16) scores. After adjustment for covariates, cognitive delay decreased by 88% in RI compared with RC (aOR, 0.12; 95% CI, 0.03, 0.53). Linear growth at 24 months was a key predictor of developmental scores for both groups (range, B = 0.04-0.14; 95% CI, 0.01, 0.07 and 0.09, 0.20). **CONCLUSIONS:** Our results highlight that, without directly intervening on nutritional and poverty status, a community-based ECD intervention, delivered by trained Roma women to Roma children, can significantly improve neurodevelopmental outcomes at age 2 years. **WHAT IS KNOWN:** \* The Roma are Europe's largest ethnic minority. High rates of neurodisability, malnutrition and poverty are reported in Roma preschoolers. \* Optimal early child development (ECD) is foundational to lifecourse health and wellbeing. Early interventions improve ECD outcomes in vulnerable children; however, evidence from Roma communities is limited. **WHAT IS NEW:** \* The Omama project is a community-based ECD intervention, delivered by trained Roma women to Roma children aged 3 weeks to 20 months living in impoverished settlements in Eastern Slovakia. \* Roma children receiving the intervention had (i) higher cognitive, language and fine motor scores and (ii) lower rates of cognitive delay compared with controls.

**Elvrum, A. G., Karstad, S. B., Hansen, G., Bjorkoy, I. R., Lydersen, S., Grunewaldt, K. H., & Eliasson, A. (2024). [The small step early intervention program for infants at high risk of cerebral palsy: A single-subject research design study. \*Journal of Clinical Medicine\*, 13\(17\)](#)**

**Background/Objectives:** Early interventions for infants at high risk of cerebral palsy (CP) are recommended, but limited evidence exists. Our objective was, therefore, to evaluate the effects of the family-centered and interprofessional Small Step early intervention program on motor development in infants at high risk of CP (ClinicalTrials.gov: NCT03264339). **Methods:** A single-subject research design was employed to investigate participant characteristics (motor dysfunction severity measured using the Hammersmith Infant Neurological Examination (HINE) and Alberta Infant Motor Scale (AIMS) at three months of corrected age (3mCA) related to intervention response. The repeated measures Peabody Developmental Motor Scales-2 fine and gross motor composite (PDMS2-FMC and -GMC) and Hand Assessment for Infants (HAI) were analyzed visually by cumulative line graphs, while the Gross Motor Function Measure-66 (GMFM-66) was plotted against reference percentiles for various Gross Motor Function Classification System (GMFCS) levels. **Results:** All infants (n = 12) received the Small Step program, and eight completed all five training steps. At two years of corrected age (2yCA), nine children were diagnosed with CP. The children with the lowest HINE : All infants (n = 12) received the Small Step program, and eight completed all five training steps. At two years of corrected age (2yCA), nine children were diagnosed with CP. The children with the lowest HINE 7 showed the largest improvements and were not diagnosed with CP 2yCA. **Conclusions:** Our results





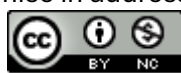
indicate that the Small Step program contributed to the children's motor development, with better results for those with an initial higher HINE (>25). The specificity of training could not be confirmed.

**Hanson, J. H., Majnemer, A., Pietrangelo, F., Dickson, L., Shikako, K., Dahan-Oliel, N., . . . Ogourtsova, T. (2024). [Evidence-based early rehabilitation for children with cerebral palsy: Co-development of a multifaceted knowledge translation strategy for rehabilitation professionals](#). *Frontiers in Rehabilitation Sciences*, *5*, 1413240.**

**Background:** Cerebral palsy (CP) is the most common childhood physical disability. Early and evidence-based rehabilitation is essential for improving functional outcomes in children with CP. However, rehabilitation professionals face barriers to adopting evidence-based practices (EBPs). The objective of this project is to develop a knowledge translation (KT) strategy to support CP-EBP among pediatric rehabilitation professionals. **Methods:** We follow an integrated KT approach by collaborating with clinician- and patient-partners. Partners engaged in co-design through team meetings and content review via email. The KT strategy comprises two components: (1) An electronic (e)-KT toolkit was created from summarized evidence extracted from randomized clinical trials on early rehabilitation for children with CP, and (2) a multifaceted online KT training program developed with guidance from a scoping review exploring effective KT strategies. **Results:** The e-KT toolkit summarizes twenty-two early interventions for children with or at risk for CP aged 0-5 years. Each module features an introduction, resources, parent/family section, and clinician information, including outcomes, intervention effectiveness, and evidence level. The KT training program includes three 10-15 min video-based training modules, text summaries, quizzes, and case studies. Site champions, identified as qualified rehabilitation professionals, were onboarded to support the site implementation of the training program. A champion-training booklet and 1-hour session were designed to equip them with the necessary knowledge/resources. **Conclusion:** The tailored, multifaceted, and co-designed KT strategy aims to be implemented in pediatric rehabilitation sites to support professional's uptake of CP-EBPs. Lessons learned from its development, including the co-development process and multifaceted nature, hold potential for broader applications in rehabilitation.

**Mazurek, M. O., Nevill, R. E., Orlando, K., Page, K., Howard, M., & Davis, B. E. (2024). [Integration of family navigation into ECHO autism for pediatric primary care in underserved communities](#). *Journal of Autism & Developmental Disorders*,**

Children with autism from underserved communities face complex system-, provider-, and family-level barriers to accessing timely diagnosis and early intervention. The current study evaluated the preliminary effects and feasibility of a new program (ECHO Autism LINKS) that integrated pediatric primary care provider (PCP) training with family navigation (FN) to bridge the gaps between screening, referral, and service access. Three cohorts of PCPs (n = 42) participated in the program, which consisted of 60-minute sessions delivered by Zoom twice per month for 12 months. Each session included didactics, case-based learning, and collaborative discussion with participants and an interdisciplinary team of experts. Family navigators were members of the expert team and provided FN services to families referred by PCP participants. Program attendance and engagement were strong, with 40 cases presented and 258 families referred for FN services, most of whom (83%) needed help accessing and connecting with services, and 13% required ongoing support due to complex needs. PCPs demonstrated significant improvements in self-efficacy in providing best-practice care for children with autism, reported high satisfaction, and observed improved knowledge and practice as a result of the program. The results of this initial pilot provide support for the feasibility, acceptability, and preliminary efficacy of the ECHO Autism LINKS program. The model holds promise in addressing complex barriers to healthcare access by providing both





PCPs and families with the knowledge and support they need. Future research is needed to evaluate the efficacy and effectiveness of the program in improving child and family outcomes.

**Adaikina, A., Derraik, J. G. B., Taylor, J., O'Grady, G. L., Hofman, P. L., & Gusso, S. (2023).** [Vibration therapy as an early intervention for children aged 2-4 years with cerebral palsy: A feasibility study.](#) *Physical & Occupational Therapy in Pediatrics, 43(5), 564–581.*

**Aims:** To evaluate the feasibility and acceptability of vibration therapy (VT) in preschool children with cerebral palsy (CP) and obtain preliminary data on its potential effectiveness. **Methods:** Nine children aged 2.5–4.8 years (4 boys) with CP GMFCS levels I–III participated in a single-group feasibility study, undergoing a 12-week control period without intervention, followed by 12 weeks of home-based VT (four times/week, 9 min/day, frequency 20 Hz). We assessed adherence to VT protocol, adverse events, and family acceptability of VT. Clinical assessments included motor function (GMFM-66), body composition (DXA), mobility (10-meter walk/run test), and health-related quality of life (PedsQL). **Results:** VT was well tolerated and acceptable to families, with high adherence levels reported (mean = 93%). There were no observed between-period differences (DELTAControl vs DELTAVT) except for an improvement in the PedsQL "Movement & Balance" dimension with VT ( $p = 0.044$ ). Nonetheless, changes after the VT but not the Control period were suggestive of potential treatment benefits for mobility, gross motor function, and body composition (lean mass and legs bone mineral density). **Conclusion:** Home-based VT is feasible and acceptable for preschool children with CP. Our preliminary data suggest potential health benefits from VT for these children, supporting larger randomized trials to assess its effectiveness properly.

**Morgan, C., Badawi, N., & Novak, I. (2023).** ["A different ride": A qualitative interview study of parents' experience with early diagnosis and goals, activity, motor enrichment \(GAME\) intervention for infants with cerebral palsy.](#) *Journal of Clinical Medicine, 12(2)*

Cerebral palsy is the most common physical disability of childhood, and early diagnosis followed by best practice early intervention is important for optimizing child and family outcomes. We investigated parents' views of an early diagnosis of cerebral palsy (CP), followed by Goals, Activity, Motor Enrichment (GAME) intervention. Semi-structured interviews were conducted within a pilot randomised clinical trial. Transcriptions were analyzed using grounded theory. Participants were nine mothers whose infants had received GAME intervention because they were identified as being at high risk for cerebral palsy early in infancy. The parenting experience was described as a "different ride". The diagnosis was devastating with many time-consuming challenges, but acceptance ensued. Parents wanted an early diagnosis, prognosis, and early intervention, despite the anxiety and workload, because it meant they could help. Parents perceived that GAME was beneficial because they were taught how to help; it was goal-based and home-based. They believed the collaboration and communication skills of the therapist shaped success. Future research should focus on a broader range of participants to understand parent's experiences with key aspects of early intervention more fully.

**Davidson, S., Ward, R., Elliott, C., Harris, C., Bear, N., Thornton, A., . . . Valentine, J. (2022).** [From guidelines to practice: A retrospective clinical cohort study investigating implementation of the early detection guidelines for cerebral palsy in a state-wide early intervention service.](#) *BMJ Open, 12(11), e063296.*

**OBJECTIVES:** To report on knowledge translation strategies and outcomes from the implementation of the early detection guidelines for cerebral palsy (CP) in a state-wide tertiary early intervention (EI) service and investigate the impact of social determinants on clinical services. **DESIGN:** Retrospective longitudinal cohort study. **SETTING:** The Western Australia tertiary paediatric EI service. **PARTICIPANTS:** EI clinicians, consumers and children using the EI





service. **OUTCOME MEASURES:** Knowledge translation strategies including consumer perspectives, clinician training and Communities of Practice (CoP) guided implementation. We measured changes in referral number and age, delivery of early detection and intervention following the implementation of the guidelines. Exposure to adverse childhood experiences (ACEs), appointment non-attendance (DNA) rates, remoteness and socioeconomic quintiles were used to measure social determinants of health using negative binomial (Incidence Rate Ratios, IRR) and logistic regression (Odds Ratios, ORs). **RESULTS:** Ten consumers participated in Focus Groups, 100 clinicians were trained and 22 clinicians established a monthly CoP. Referrals increased fourfold to 511 children. Corrected gestational age at referral decreased from a median of 16.1 to 5.1 months (p: Ten consumers participated in Focus Groups, 100 clinicians were trained and 22 clinicians established a monthly CoP. Referrals increased fourfold to 511 children. Corrected gestational age at referral decreased from a median of 16.1 to 5.1 months (p: Ten consumers participated in Focus Groups, 100 clinicians were trained and 22 clinicians established a monthly CoP. Referrals increased fourfold to 511 children. Corrected gestational age at referral decreased from a median of 16.1 to 5.1 months (p: **CONCLUSIONS:** Implementation strategies reduced referral age and improved the delivery of early detection assessments. Further investigation of the association between social disadvantage, DNA risk and ACE score is required in the development of a state-wide early detection network.

**Harniess, P. A., Gibbs, D., Bezemer, J., & Purna Basu, A. (2022). [Parental engagement in early intervention for infants with cerebral palsy-A realist synthesis](#). *Child: Care, Health & Development*, 48(3), 359–377.**

**BACKGROUND:** Emphasis on parental engagement strategies within occupational therapy and physiotherapy early intervention (EI) programmes for infants at high risk of cerebral palsy (CP) has increased. This reflects consensus that increasing parent participation enhances treatment efficacy, potentially improving infant and parent outcomes. However, evaluation of parental engagement in EI is complex. Despite the growing application of parental engagement strategies, aligned with family-centred care practice, theoretical evaluation is currently lacking within the literature. This realist synthesis aimed to identify component theories underlying EI strategies to support parental engagement and to use empirical findings to evaluate how these work in practice. **METHODS:** Realist synthesis: Databases Medline, Embase, Amed, CINAHL and PsychInfo were searched (from February 1985 - February 2020); further articles were sourced from reference lists. A data extraction form was used, and a Critical Appraisal Skills Programme tool was used to assess study rigour. **RESULTS:** Twenty-six articles were included. Quality of relationships, parent education and intervention co-design were the key themes related to parental engagement strategies. Findings indicate that constructive parent reasoning mechanisms of trust, belief, sense of control, perceived feasibility of home programme delivery and ultimately motivation are linked to the underlying intervention resources afforded by specific strategies (e.g., coaching pedagogy). These responses are precursors to engagement outcomes that include increased parental self-efficacy and adherence. Importantly, parental self-efficacy can initiate a process of change leading to improved parental confidence and anxiety. **CONCLUSIONS:** Sensitively designed programme strategies, centred on relational quality between parent, infant and therapist, are fundamental for effective parent connection, involvement and investment within EI for infants with CP.

**Miller, L., Nickson, G., Pozniak, K., Khan, D., Imms, C., Ziviani, J., . . . Rosenbaum, P. (2022). [ENabling VISions and growing expectations \(ENVISAGE\): Parent reviewers' perspectives of a co-designed program to support parents raising a child with an early-onset neurodevelopmental disability](#). *Research in Developmental Disabilities*, 121, 104150.**

**AIMS:** This study reports parents' perspectives of, ENVISAGE: ENabling VISions And Growing



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Expectations. ENVISAGE - co-designed by parents and researchers - is an early intervention program for parents raising children with neurodisability. **METHODS AND PROCEDURES:** Using an integrated Knowledge Translation approach, this feasibility study explored parents' perspectives of the comprehensibility, acceptability, and usability of ENVISAGE workshops. Participants were Australian and Canadian parents of children with neurodisabilities,  $\geq 12$  months post-diagnosis, who independently reviewed ENVISAGE workshops using an online learning platform. Parents completed study-specific 5-point Likert-scaled surveys about individual workshops. Following this, qualitative interviews about their perceptions of ENVISAGE were conducted. Survey data were analysed descriptively, and interviews analysed inductively using interpretive description. **OUTCOMES AND RESULTS:** Fifteen parents completed surveys, of whom 11 participated in interviews. Workshops were reported to be understandable, relevant, and meaningful to families. ENVISAGE was judged to empower parents through enhancing knowledge and skills to communicate, collaborate and connect with others. Pragmatic recommendations were offered to improve accessibility of ENVISAGE. **CONCLUSIONS AND IMPLICATIONS:** ENVISAGE workshops address key issues and concerns of parents of children with neurodisability in a way that was perceived as empowering. Involving parents as reviewers enabled refinement of the workshops prior to the pilot study.

**Spittle, A. J., Anderson, P. J., Tapawan, S. J., Doyle, L. W., & Cheong, J. L. Y. (2021). [Early developmental screening and intervention for high-risk neonates - from research to clinical benefits](#). *Seminars in Fetal & Neonatal Medicine*, 26(3), 101203.**

With advances in neonatal care there has been an increase in survival rates for infants born very preterm and/or with complex needs, such as those who require major surgery, who may not have survived decades ago. Despite advances in survival, these infants remain at high-risk for a range of neurodevelopmental delays and/or impairments including motor, cognitive and emotional/behavioural challenges. Research has improved our ability to identify which infants are at high-risk of developmental delay and/or impairments, and there is mounting evidence that early interventions can improve outcomes of these infants. However, clinical practice varies throughout the world regarding recommendations for developmental screening. Moreover, intervention, when available, is often not commenced early enough in development. Given limited resources, those infants most at risk of developmental impairments and their families should be targeted, with further research needed on the cost-effectiveness of surveillance and early interventions.

**Sorensen, K., Vestrheim, I. E., Lerdal, B., & Skranes, J. (2020). [Functional skills among preschool children with cerebral palsy - assessment before and after early intervention](#). *Developmental Neurorehabilitation*, 23(8), 519–525.**

**Objective:** To assess and evaluate the change in functional skills among children with cerebral palsy (CP) who participated in an intensified habilitation program. **Methods:** In this prospective longitudinal study, a cohort of 39 preschool children (2-5 years) with cerebral palsy (Gross Motor Function Classification System levels I-V) together with their parents participated in an intensified multidimensional habilitation program for 1 year. Activities strengthening functional skills were among the main interventions. The children were evaluated with the Pediatric Evaluation of Disability Inventory before and after the program period. **Results:** Only children at GMFCS levels I-II showed improvements in mobility and social function on norm-referenced scales. After the intervention period, these children scored similar to the mean for typically developing children of the same age on the social function domain. **Conclusions:** Functional skills among preschool children with CP, GMFCS levels I-II, seems strengthened after participation in an intensified habilitation program.





**Ueda, K., & Yonemoto, N. (2020). [Impacts of early intervention on family outcomes: A multicenter cross-sectional study in Japan](#). *Disability & Health Journal*, 13(1), 100832.**

**BACKGROUND:** Recently, the concept of "family-centered" practice was integrated into early intervention programs in Japan. Services provided through early intervention can result in beneficial family outcomes. We previously validated the Family Outcomes Survey-Revised (FOS-R) for use in Japan, but the impact on families was not evaluated. **OBJECTIVES:** To evaluate potential impacts of early intervention on family outcomes and factors associated with outcome attainment. **METHOD:** An anonymous, self-administered questionnaire was given to mothers of pre-school-age children with disabilities who were currently receiving early intervention at one of 12 development support centers across Japan. We evaluated scores of the Japanese version of the FOS-R using multivariable random effect models. **RESULTS:** Data from a total of 394 mothers were analyzed. Longer duration of early intervention was positively associated with family outcomes (: Data from a total of 394 mothers were analyzed. Longer duration of early intervention was positively associated with family outcomes (: Data from a total of 394 mothers were analyzed. Longer duration of early intervention was positively associated with family outcomes (**CONCLUSIONS:** This study suggests that early intervention is associated with better outcomes for families, especially for families who perceive early intervention as helpful.

**Novak, I., & Morgan, C. (2019). [High-risk follow-up: Early intervention and rehabilitation](#). *Handbook of Clinical Neurology*, 162, 483–510.**

Early detection of childhood disability is possible using clinically available tools and procedures. Early detection of disability enables early intervention that maximizes the child's outcome, prevents the onset of complications, and supports parents. In this chapter, first we summarize the best-available tools for accurately predicting major childhood disabilities early, including autism spectrum disorder, cerebral palsy, developmental coordination disorder, fetal alcohol spectrum disorder, intellectual disability, hearing impairment, and visual impairment. Second, we provide an overview of the preclinical and clinical evidence for inducing neuroplasticity following brain injury. Third, we describe and appraise the evidence base for: (a) training-based interventions that induce neuroplasticity, (b) rehabilitation interventions not focused on inducing neuroplasticity, (c) complementary and alternative interventions, (d) environmental enrichment interventions in the neonatal intensive care and community settings, and (e) parent-child interaction interventions in the neonatal intensive care and community settings. Fourth, we explore emergent treatment options at clinical trial, designed to induce brain repair following injury. In conclusion, early diagnosis enables early intervention, which improves child and parent outcomes. We now know which interventions provide the biggest gains and the information can be used to help inform parental decision making when designing treatment plans for their children.

**Ching, T. Y. C., Dillon, H., Leigh, G., & Cupples, L. (2018). [Learning from the longitudinal outcomes of children with hearing impairment \(LOCHI\) study: Summary of 5-year findings and implications](#). *International Journal of Audiology*, 57(sup2), S105–S111.**

**OBJECTIVE:** This article summarises findings of the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study, and discusses implications of the findings for research and clinical practice. **DESIGN:** A population-based study on outcomes of children with hearing loss. Evaluations were conducted at five years of age. **STUDY SAMPLE:** Participants were 470 children born with hearing loss between 2002 and 2007 in New South Wales, Victoria and Queensland in Australia, and who first received amplification or cochlear implantation by three years of age. **RESULTS:** The earlier hearing aids or cochlear implants were fitted, the better the speech, language and functional performance outcomes. Better speech perception was also associated with better language and higher cognitive abilities. Better psychosocial development





was associated with better language and functional performance. Higher maternal education level was also associated with better outcomes. Qualitative analyses of parental perspectives revealed the multiple facets of their involvement in intervention. **CONCLUSIONS:** The LOCHI study has shown that early fitting of hearing devices is key to achieving better speech, language and functional performance outcomes for children with hearing loss. The findings are discussed in relation to changes in clinical practice and directions for future research.

**Ching, T. Y., Zhang, V. W., Flynn, C., Burns, L., Button, L., Hou, S., . . . Van Buynder, P. (2018). [Factors influencing speech perception in noise for 5-year-old children using hearing aids or cochlear implants](#). *International Journal of Audiology*, 57(sup2), S70–S80.**

**OBJECTIVE:** We investigated the factors influencing speech perception in babble for 5-year-old children with hearing loss who were using hearing aids (HAs) or cochlear implants (CIs). **DESIGN:** Speech reception thresholds (SRTs) for 50% correct identification were measured in two conditions - speech collocated with babble, and speech with spatially separated babble. The difference in SRTs between the two conditions give a measure of binaural unmasking, commonly known as spatial release from masking (SRM). Multiple linear regression analyses were conducted to examine the influence of a range of demographic factors on outcomes. **STUDY SAMPLE:** Participants were 252 children enrolled in the Longitudinal Outcomes of Children with Hearing Impairment (LOCHI) study. **RESULTS:** Children using HAs or CIs required a better signal-to-noise ratio to achieve the same level of performance as their normal-hearing peers but demonstrated SRM of a similar magnitude. For children using HAs, speech perception was significantly influenced by cognitive and language abilities. For children using CIs, age at CI activation and language ability were significant predictors of speech perception outcomes. **CONCLUSIONS:** Speech perception in children with hearing loss can be enhanced by improving their language abilities. Early age at cochlear implantation was also associated with better outcomes.

**Cupples, L., Ching, T. Y. C., Button, L., Leigh, G., Marnane, V., Whitfield, J., . . . Martin, L. (2018). [Language and speech outcomes of children with hearing loss and additional disabilities: Identifying the variables that influence performance at five years of age](#). *International Journal of Audiology*, 57(sup2), S93–S104.**

**OBJECTIVE:** This study examined language and speech outcomes in young children with hearing loss and additional disabilities. **DESIGN:** Receptive and expressive language skills and speech output accuracy were evaluated using direct assessment and caregiver report. Results were analysed first for the entire participant cohort, and then to compare results for children with hearing aids (HAs) versus cochlear implants (CIs). **STUDY SAMPLE:** A population-based cohort of 146 five-year-old children with hearing loss and additional disabilities took part. **RESULTS:** Across all participants, multiple regressions showed that better language outcomes were associated with milder hearing loss, use of oral communication, higher levels of cognitive ability and maternal education, and earlier device fitting. Speech output accuracy was associated with use of oral communication only. Average outcomes were similar for children with HAs versus CIs, but their associations with demographic variables differed. For HA users, results resembled those for the whole cohort. For CI users, only use of oral communication and higher cognitive ability levels were significantly associated with better language outcomes. **CONCLUSIONS:** The results underscore the importance of early device fitting for children with additional disabilities. Strong conclusions cannot be drawn for CI users given the small number of participants with complete data.

**Kramer, J. M., Hwang, I. T., Levin, M., Acevedo-Garcia, D., & Rosenfeld, L. (2018). [Identifying environmental barriers to participation: Usability of a health-literacy informed problem-identification approach for parents of young children with developmental](#)**



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**disabilities. *Child: Care, Health & Development, 44(2), 249–259.***

**BACKGROUND:** Parents of very young children recently diagnosed with developmental disabilities (DD) need to identify environmental barriers to their children's participation and adopt an adaptive orientation to solving these problems. Given the health service disparities for diverse families, parents may benefit from easy to use problem-identification approaches that address environmental barriers stemming from community and policy contexts. This feasibility study evaluated the usability of a health literacy-informed, structured, environment-focused problem-identification approach for parents of young children with DD. **METHODS:** We used purposeful, convenience sampling to enrol 9 mothers of children ages 1-3 with DD (4 racial/ethnic minorities, 3 high school education, 4 annual household income : We used purposeful, convenience sampling to enrol 9 mothers of children ages 1-3 with DD (4 racial/ethnic minorities, 3 high school education, 4 annual household income **RESULTS:** Parents identified 121 environmental barriers without the approach. When using the approach and prompted to consider home, community, and policy barriers, parents identified an additional 222 environmental barriers; the greatest number of barriers were aligned with International Classification of Functioning, Disability, and Health-Children and Youth environment Chapter 5 "Services, systems, and policies." Using the approach, parents with a postgraduate education and annual household income >\$80,000 identified the most environmental barriers, and parents reporting the lowest annual household incomes identified the fewest environmental barriers. When parents attributed participation challenges to an environmental barrier, ~57% of solutions required parents to interact with individuals at the community or policy level. **CONCLUSIONS:** This study suggests that parents with a range of background characteristics can use a structured, environment-focused problem-identification approach. With the approach, parents are more likely to attribute participation challenges to environmental barriers and adopt a problem-solving orientation focused on changes to the community and policy context.

**Litt, J. S., Glymour, M. M., Hauser-Cram, P., Hehir, T., & McCormick, M. C. (2018). [Early intervention services improve school-age functional outcome among neonatal intensive care unit graduates. \*Academic Pediatrics, 18\(4\), 468–474.\*](#)**

**OBJECTIVE:** To evaluate the effect of community-based early intervention (EI) services the on functional outcomes of high-risk infants at school age. **METHODS:** This was a retrospective cohort study using data from the US Department of Education's National Early Intervention Longitudinal Study. Participants were enrolled in 1997 to 1998 with follow-up through 5 years and had a neonatal intensive care unit (NICU) admission, birth weight >400 g, and gestational age >23 weeks. Kindergarten outcomes were teacher assessments of academic and physical skills compared with classmates. Because treatment assignment is determined according to level of clinical need, we used repeated measures, marginal structural models with inverse probability of treatment weighting to account for confounding by indication. **RESULTS:** Of 405 participants, 47% had academic ratings average/above average and 71% had physical skills ratings average/above average. Odds of average/above average academic skills were lower for those with delayed EI enrollment (adjusted odds ratio [aOR], 0.65; 95% confidence interval [CI], 0.43-0.99) and trending, although not significantly, higher for those with greater service duration (aOR, 1.47; 95% CI, 0.98-2.22) and breadth (odds ratio, 1.74; 95% CI, 0.95-3.20). Odds of average/above average physical skills were lower for those with delayed EI enrollment (aOR, 0.61; 95% CI, 0.40-0.93) and higher for those with greater intensity (aOR, 1.06; 95% CI, 1.00-1.13) and breadth (aOR, 1.86; 95% CI, 1.03-3.35), approaching significance for those with greater service duration (aOR, 1.41; 95% CI, 0.96-2.09). **CONCLUSIONS:** Longer, more intense services were associated with higher kindergarten skills ratings in children at risk for disabilities. Our novel findings support the effectiveness of large-scale EI programs and reinforce the





importance of referral after NICU discharge. Copyright © 2017 Academic Pediatric Association. Published by Elsevier Inc. All rights reserved.

**Mills, I. S., Doyle, L. W., Cheong, J. L., & Roberts, G. (2018).** [Rates of early intervention services in children born extremely preterm/extremely low birthweight.](#) *Journal of Paediatrics & Child Health*, 54(1), 74–79.

**AIM:** To determine the rates of early intervention (EI) service use in extremely preterm (EP, : To determine the rates of early intervention (EI) service use in extremely preterm (EP, : To determine the rates of early intervention (EI) service use in extremely preterm (EP, **METHODS:** Participants comprised consecutive EP or ELBW survivors born in 1991-1992, 1997 or 2005 in Victoria, Australia, and randomly selected, matched term-born controls. The main outcome measure was parent-reported EI participation up to 8 years of age. Neurodevelopmental outcomes and socio-economic risk factors were compared with EI participation to identify associations among the preterm groups. **RESULTS:** The rates of EI were higher in the preterm groups than the control groups overall (odds ratio 4.29, 95% confidence interval 3.28, 5.59, P : The rates of EI were higher in the preterm groups than the control groups overall (odds ratio 4.29, 95% confidence interval 3.28, 5.59, P **CONCLUSION:** EI participation is high in the EP population, and rates of EI use have increased over time. Contrary to previous reports, social risk factors were not found to be associated with EI use.

**Fulcher, A. N., Purcell, A., Baker, E., & Munro, N. (2015).** [Factors influencing speech and language outcomes of children with early identified severe/profound hearing loss: Clinician-identified facilitators and barriers.](#) *International Journal of Speechlanguage Pathology*, 17(3), 325–333.

**PURPOSE:** Early identification of severe/profound childhood hearing loss (HL) gives these children access to hearing devices and early intervention to facilitate improved speech and language outcomes. Predicting which infants will go on to achieve such outcomes remains difficult. This study describes clinician identified malleable and non-malleable factors that may influence speech and language outcomes for children with severe/profound HL. **METHOD:** Semi-structured interviews were conducted with six experienced auditory verbal clinicians. A collective case study design was implemented. The interviews were transcribed and coded into themes using constant comparative analysis. **RESULT:** Clinicians identified that, for children with severe/profound HL, early identification, early amplification and commencing auditory-verbal intervention under 6 months of age may facilitate child progress. Possible barriers were living in rural/remote areas, the clinicians' lack of experience and confidence in providing intervention for infants under age 6-months and belonging to a family with a culturally and linguistically diverse (CALD) background. **CONCLUSION:** The results indicate that multiple factors need to be considered by clinicians working with children with HL and their families to determine how each child functions within their own environment and personal contexts, consistent with the International Classification of Functioning, Disability and Health (ICF) framework. Such an approach is likely to empower clinicians to carefully balance potential barriers to, and facilitators of, optimal speech and language outcomes for all children with HL.

**Basu, A. P., Pearse, J., Kelly, S., Wisher, V., & Kisler, J. (2014).** [Early intervention to improve hand function in hemiplegic cerebral palsy.](#) *Frontiers in Neurology [Electronic Resource]*, 5, 281.

Children with hemiplegic cerebral palsy often have marked hand involvement with excessive thumb adduction and flexion and limited active wrist extension from infancy. Post-lesional aberrant plasticity can lead to progressive abnormalities of the developing motor system. Disturbances of somatosensory and visual function and developmental disregard contribute to difficulties with hand use. Progressive soft tissue and bony changes may occur, leading to



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contractures, which further limit function in a vicious cycle. Early intervention might help to break this cycle, however, the precise nature and appropriateness of the intervention must be carefully considered. Traditional approaches to the hemiplegic upper limb include medications and botulinum toxin injections to manage abnormalities of tone, and surgical interventions. Therapist input, including provision of orthoses, remains a mainstay although many therapies have not been well evaluated. There has been a recent increase in interventions for the hemiplegic upper limb, mostly aimed outside the period of infancy. These include trials of constraint-induced movement therapy (CIMT) and bimanual therapy as well as the use of virtual reality and robot-assisted therapy. In future, non-invasive brain stimulation may be combined with therapy. Interventions under investigation in the infant age group include modified CIMT and action observation therapy. A further approach which may be suited to the infant with thumb-in-palm deformity, but which requires evaluation, is the use of elastic taping. Enhanced cutaneous feedback through mechanical stimulation to the skin provided by the tape during movement has been postulated to modulate ongoing muscle activity. If effective, this would represent a low-cost, safe, widely applicable early intervention.

**Tuominen-Eriksson, A., Svensson, Y., & Gunnarsson, R. K. (2013). [Children with disabilities are often misdiagnosed initially and children with neuropsychiatric disorders are referred to adequate resources 30 months later than children with other disabilities](#). *Journal of Autism & Developmental Disorders*, 43(3), 579–584.**

Disabilities in a child may lead to low self-esteem and social problems. The lives of parents and siblings are also affected. Early intervention may decrease these consequences. To promote early intervention early referral to adequate resources is essential. In a longitudinal retrospective observational study it was found that children with neuropsychiatric disorders without mental retardation were referred 30 months later than other children. Agreement between the referrer's identification of the main disability and the habilitation center's was low with Kappa coefficient 0.44. Whereby agreement on diagnosis between referrer and habilitation centers was low, earlier referral should be promoted.

**Fernell, E., Hedvall, A., Westerlund, J., Hoglund Carlsson, L., Eriksson, M., Barnevik Olsson, M., . . . Gillberg, C. (2011). [Early intervention in 208 swedish preschoolers with autism spectrum disorder. A prospective naturalistic study](#). *Research in Developmental Disabilities*, 32(6), 2092–2101.**

Early intervention has been reported to improve outcome in children with autism spectrum disorders (ASDs). Several studies in the field have been randomized controlled trials (RCTs). The aim of this study was to assess ASD outcome in a large naturalistic study. Two hundred and eight children, aged 20-54 months, with a clinical diagnosis of ASD were given intervention and monitored prospectively in a naturalistic fashion over a period of 2 years. The toddlers were considered representative of all but the most severely multiple disabled preschool children with ASD in Stockholm county. They fell into three cognitive subgroups: one with learning disability, one with developmental delay, and one with normal intellectual functioning. Data on intervention type and intensity were gathered prospectively in a systematic fashion. Intervention was classified into intensive applied behaviour analysis (ABA) and non-intensive, targeted interventions, also based on ABA principles. Children were comprehensively assessed by a research team before the onset of intervention, and then, again, 2 years later. Change in Vineland adaptive behaviour scales composite scores from intake (T1) to leaving the study (T2) was set as the primary outcome variable. The research team remained blind to the type and intensity of interventions provided. One hundred and ninety-eight (95%) of the original samples stayed in the study throughout the whole 2-year period and 192 children had a complete Vineland composite score results both at T1 and T2. Vineland composite scores increased over the 2-year period. This increase was accounted for by the subgroup with normal cognitive





functioning. There was no significant difference between the intensive and non-intensive groups. Individual variation was considerable, but no child in the study was "problem-free" at follow-up. Our data do not support that children with ASD generally benefit more from the most intensive ABA intervention programs than from less intensive interventions or targeted interventions based on ABA.

**Giannoni, P. P., & Kass, P. H. (2010). [Risk factors of children who exited from an early intervention program without an identified disability and returned with a developmental disability](#). *Research in Developmental Disabilities*, 31(3), 848–856.**

A retrospective cohort study was undertaken to identify risk factors for children at greatest risk of delayed diagnosis of developmental disability. Two thousand four hundred and thirty-nine children were selected for this study due to their participation in the California Early Start (ES) Program in 1998. Comparisons were made among children that had no break in services offered through the ES Program versus children that returned with a disability after exiting the ES Program. Factors examined include child's condition and qualifying risk factors, mother's demographic characteristics, family's risk factors, and risk scores developed for each county in which the family resided. Children with a delay in diagnosis of a disability have characteristics that fall outside the norm for the identification of a disability. It is not clear if this is related to age-specific manifestation to the appearance of a disability or to conditions difficult to diagnose.

**Guideline**

**Morgan, C., Feters, L., Adde, L., Badawi, N., Bancale, A., Boyd, R. N., . . . Novak, I. (2021). [Early intervention for children aged 0 to 2 years with or at high risk of cerebral palsy: International clinical practice guideline based on systematic reviews](#). *JAMA Pediatrics*, 175(8), 846–858.**

**Importance:** Cerebral palsy (CP) is the most common childhood physical disability. Early intervention for children younger than 2 years with or at risk of CP is critical. Now that an evidence-based guideline for early accurate diagnosis of CP exists, there is a need to summarize effective, CP-specific early intervention and conduct new trials that harness plasticity to improve function and increase participation. Our recommendations apply primarily to children at high risk of CP or with a diagnosis of CP, aged 0 to 2 years. **Objective:** To systematically review the best available evidence about CP-specific early interventions across 9 domains promoting motor function, cognitive skills, communication, eating and drinking, vision, sleep, managing muscle tone, musculoskeletal health, and parental support. **Evidence Review:** The literature was systematically searched for the best available evidence for intervention for children aged 0 to 2 years at high risk of or with CP. Databases included CINAHL, Cochrane, Embase, MEDLINE, PsycInfo, and Scopus. Systematic reviews and randomized clinical trials (RCTs) were appraised by A Measurement Tool to Assess Systematic Reviews (AMSTAR) or Cochrane Risk of Bias tools. Recommendations were formed using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework and reported according to the Appraisal of Guidelines, Research, and Evaluation (AGREE) II instrument. **Findings:** Sixteen systematic reviews and 27 RCTs met inclusion criteria. Quality varied. Three best-practice principles were supported for the 9 domains: (1) immediate referral for intervention after a diagnosis of high risk of CP, (2) building parental capacity for attachment, and (3) parental goal-setting at the commencement of intervention. Twenty-eight recommendations (24 for and 4 against) specific to the 9 domains are supported with key evidence: motor function (4 recommendations), cognitive skills (2), communication (7), eating and drinking (2), vision (4), sleep (7), tone (1), musculoskeletal health (2), and parent support (5). **Conclusions and Relevance:** When a child meets the criteria of high risk of CP, intervention should start as soon as possible. Parents want an early diagnosis and treatment and support





implementation as soon as possible. Early intervention builds on a critical developmental time for plasticity of developing systems. Referrals for intervention across the 9 domains should be specific as per recommendations in this guideline.

## FOR OFFICE USE ONLY

DATABASES AND INFORMATION SOURCES USED				
	Pubmed		HMIC	BMJ Best Practice
X	Medline		Social Policy and Practice	Cochrane Library
	Emcare		CINAHL	TRIP
X	Embase		PsycINFO	X Grey Literature
	AMED		UpToDate	Other

PURPOSE OF SEARCH		
	Patient info/health & well being	Clinical decision making (inc. patient care)
	Executive Team support	Research/Education/Professional development
	Quality Improvement	X Primary Care & Neighbourhoods Directorate support
	KM/Management decision making	Other

USER CATEGORY OF REQUESTOR		
	Medical students	Patients/public
	Nursing/midwifery students	Physician Associates
X	Doctor/Psychiatrist	Public Health (Somerset CC)
	Nurses/Midwives	Other
	Allied Health professionals	





HAS PERMISSION TO SHARE THE RESULTS BEEN OBTAINED FROM THE REQUESTOR?	
X	YES - share
	NO – do not share

KEY WORDS/SEARCH STRATEGY INCLUDING MESH HEADINGS	LIMITS USED
<ol style="list-style-type: none"> <li>1. child*.af.</li> <li>2. exp child/ or infant/ or exp infant, newborn/</li> <li>3. (paediatric* or pediatric*).af.</li> <li>4. (kid* or toddler*).af.</li> <li>5. (baby or babies).af.</li> <li>6. infant*.af.</li> <li>7. under 5.af.</li> <li>8. or/1-7</li> <li>9. Early Medical Intervention/</li> <li>10. Early Intervention, Educational/</li> <li>11. (early intervention* or early childhood intervention*).ti,ab.</li> <li>12. first 1001.ti,ab.</li> <li>13. or/9-12</li> <li>14. complex needs.ti,ab.</li> <li>15. physical disabilit*.ti,ab.</li> <li>16. genetic condition*.ti,ab.</li> <li>17. medically complex.ti,ab.</li> <li>18. Children with Disabilities/</li> <li>19. suspected disabilit*.ti,ab.</li> <li>20. risk of disabilit*.ti,ab.</li> <li>21. (child disabilit* or disabled child*).ti,ab.</li> <li>22. neurodisabilit*.ti,ab.</li> <li>23. or/14-22</li> <li>24. 8 and 13 and 23</li> <li>25. early intervention*.ti. and cerebral palsy.ti,ab.</li> <li>26. 24 or 25</li> <li>27. remove duplicates from 26</li> <li>28. 27</li> <li>29. limit 28 to (english language and yr="2010 -Current")</li> </ol>	

