Literature review on the calculation of the optimal frequency and intensity of therapeutic intervention within children’s disability services

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Statement on Language

In this report, we use the term “children with disabilities” which reflects person first language. This is in line with what is commonly used in disability services and reflects the language used in the UNCRPD (persons with disabilities). We recognise that the term ‘disabled persons or people’ which is considered to be identity first or social model language is preferred by some people. Identity-first language acknowledges the fact that people with an impairment are disabled by barriers in the environment and society and so aligns with the social and human rights model of disability. We also acknowledge that some people do not identify with either term.

For further information on disability-related language and terminology, please refer to the NDA’s Advice Paper on Disability Language and Terminology[[1]](#footnote-1)

Abbreviations

| Abbreviation | Definition |
| --- | --- |
| ABA | Applied Behaviour Analysis |
| AOTA | American Occupational Therapist’s Association |
| AOTI | Association of Occupational Therapists Ireland |
| APTA | The American Physical Therapy Association |
| ASD | Autistic spectrum disorder |
| ASHA | American Speech-Language-Hearing Association |
| BC | British Colombia |
| CBT | Cognitive behavioural therapy |
| CDNT | Children’s Disability Network Teams |
| CO-OP | Cognitive Orientation to Daily Occupational Performance |
| CP | Cerebral palsy |
| ESDM | Early Start Denver Model |
| GMFSC | Gross Motor Function Classification System |
| HIQA | Health Information Quality Authority |
| HSE | Health Service Executive |
| IAPT | Improving Access to Psychological Therapies |
| ICF | International Classification of Functioning |
| IDEA | Individuals with Disabilities Education Act |
| MACS | Manual Ability Classification System |
| MaST | The Management and Supervision Tool |
| NDA | National Disability Authority |
| NHS | National Health Service |
| NICE | National Institute for Health and Social Care Excellence |
| NIHR | National Institute for Health Research |
| NMES | Neuromuscular and Muscular Electrical Stimulation |
| OT | Occupational Therapist |
| PECS | Picture Exchange Communication System |
| PT | Physical Therapist |
| RCOT | Royal College of Occupational Therapists |
| SCIE | Social Care Institute for Excellence |
| SLP | Speech Language Pathologist |
| SLT | Speech and Language Therapist |
| TEACCH | Treatment and Education of Autistic and related Communication-handicapped Children |
| UK | United Kingdom |
| US/USA | United States of America |

Executive Summary

Introduction

The HSE requested the National Disability Authority (NDA) conduct a review of Children’s Disability Services and in particular the functioning of Children’s Disability Network Teams (CDNTs). This is an action in the Roadmap for Service Improvement 2023-2026 of Disability services for children and young people.

Part of the project plan included an in-depth review of the literature available about the frequency and number of interventions provided to children.

Establishing the appropriate level of therapeutic intervention for children with disabilities is complex. Achieving an optimal level of intervention is crucial to ensure that children receive the right amount and type of therapy to maximize their developmental potential, health outcomes and overall well-being. Some models of service tend towards supplying preset blocks of therapies which may not be suitable for children with complex disabilities.

Aim

The aim of this review is to explore the level of intervention or therapy received by children with disabilities. It will identify current practices as well as theoretical frameworks used by therapists and interdisciplinary teams. The research questions for the literature review are:

1. What is the evidence around the frequency and intensity of intervention, children with complex disabilities receive?
2. How are frequency and intensity of intervention calculated in other jurisdictions?
3. Does family involvement influence the type, frequency or intensity of therapy or intervention received?
4. How is progress monitored for children receiving therapies and interventions?

Methods

A systematic search was performed across a number of electronic academic databases, and grey literature sources, additionally, the professional bodies representing therapists in a number of countries were contacted.

Studies were included if they met the following criteria: (1) focused on intervention amount or intensity (2) written in English; and (3) available in full text.

After screening against eligibility criteria, data extraction was performed to capture key information, including the type of article, jurisdiction, and associated profession.

A narrative synthesis approach was employed to summarize and integrate findings across the included studies.

Findings

In general, in the studies reviewed, children with disabilities received interventions and therapies based on their individual needs. While some guidance exists about the formula for deciding on the frequency of interventions, none of the guidance is widely accepted. The calculation of frequency and intensity of interventions depends on several factors including the setting, therapist experience and training, family involvement, an assessment of their overall condition, as well as personal characteristics such as age and willingness to participate. To maximise benefit from therapy, a child must have specific, achievable goals. Any treatment or intervention plan must take into account the unique circumstances of children and families. Therapists must monitor children regularly, as changes can occur which require a different approach. The frequency or intensity of therapy may be informed by evidence-based practice, especially where a specific intervention is concerned.

Limitations

The review did not include non-English literature. Furthermore, the review was limited to frequency or intensity of therapies and did not address other supports or contextual factors which may improve outcomes for children with disabilities.

Conclusion

There was no ‘one size fits all’ formula to determine the optimal level of therapy. The frequency and intensity of intervention varied considerably across jurisdictions. The literature showed that there are a number of key actions that therapists and other stakeholders should take when making decisions about a child’s therapies or interventions, which are:

* Conduct thorough assessments,
* Individualise treatment plans,
* Involve the child and family,
* Monitor progress continuously and
* Consult evidence-based guidelines.

Further research is required particularly where an interdisciplinary team approach is used.

Introduction

Establishing the appropriate level of therapeutic intervention for children with disabilities is a complex task. Achieving an optimal level of intervention is crucial to ensure that children receive the right amount and type of therapy to maximize their developmental potential, health outcomes and overall well-being. (1)

Some systems tend towards using an allotted number of evidence informed therapies for specific conditions such as the Improving Access to Psychological Therapies (IAPT) model in England or the primary care psychology model in Ireland, which deliver set amounts of evidence informed therapy in a single package. (2) However, this type of model may not be useful in more complex cases where there are multiple complex issues and input from multiple disciplines is required. In such cases there are many factors to be considered including; the severity of the child's disability whereby more severe disabilities often necessitate more frequent and intensive interventions(3); the individual needs and goals of each child; the child’s specific disability, developmental stage, and personal circumstances.(4) Comprehensive assessments and evaluations are vital in understanding the child's strengths, limitations, and areas requiring intervention.(5)

Other factors that may also influence the intervention delivery include the availability of resources, including therapy equipment, specialized programmes, and support services.(5) Additionally, the level of involvement of the child's family and caregivers will influence the delivery of any therapeutic intervention.

Evidence based interventions use several variables to estimate the intervention intensity of therapies. (1) The variables used to calculate the frequency and intensity of therapy include:

* Dose (the number of correctly administered teaching episodes[[2]](#footnote-2) during a single intervention session)
* Dose form (how the therapy will be delivered)
* Dose frequency (the number of times a dose of intervention is provided)
* Total intervention duration (optimal duration for therapies)

Ultimately, intervention intensity is the product of these variables. By addressing these factors, the aim is to provide optimal support, facilitate the child's development, and improve their overall level of participation and quality of life.

Aim

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1. What is the evidence around the frequency and intensity of intervention, children with complex disabilities receive?
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4. How is progress monitored for children receiving therapies and interventions?

Methodology

Search Strategy

A search was performed using the following electronic databases; PubMed, CINAHL and Web of Science. The search strategy utilized a combination of relevant keywords, such as "intervention," "therapy intensity," "paediatric physiotherapists/occupational therapists/ speech therapists,” “paediatric disability services," and variations thereof. Boolean operators (e.g., AND, OR) were employed to refine the search and maximize the retrieval of pertinent literature.

A librarian was also consulted on the search terms and executed a search across the database platforms EBSCO and ProQuest.

Grey literature sources were searched in relation to guidelines for the amount of intervention. A search was performed of the following electronic databases: Cochrane Library, Social Care Institute for Excellence (SCIE) Trip Database, Global Index Medicus, National Institute for Health and Social Care Excellence (NICE) World Health Organisation, Agency for Healthcare Research and Quality, National Quality Forum, Lenus, Health Information and Quality Authority (HIQA), WorldCat and SCOPUS. The research team also contacted member organisations for physiotherapists, occupational therapists, speech and language therapists, and social workers, in Ireland, UK, USA, Canada, Australia, and New Zealand to seek out relevant materials.

Reference lists searches and searches of those citing key documents were also conducted.

Inclusion Criteria

Studies were included if they met the following criteria: (1) focused on intervention amount or intensity (2) written in English; and (3) available in full text.

Data Extraction and synthesis

Forty-eight relevant documents were sourced of which seven were supplied by therapist member organisations and nineteen from the grey literature search, the remainder were from academic articles.

The selected studies were screened for relevance based on the titles and abstracts. Full-text articles of potentially relevant studies were retrieved and further assessed for eligibility according to the inclusion criteria. Data extraction was performed to capture key information, including study design, sample characteristics and so on.

A narrative synthesis approach was employed to summarize and integrate findings across the included studies. Themes, patterns, and commonalities were identified to highlight the current knowledge and gaps in the literature regarding the intensity of intervention received by children with disabilities.

Findings

The literature suggests that decisions on the frequency and intensity of therapy sessions are influenced by a number of factors including the therapist’s assessment of the level of difficulty the child experiences, type of difficulty being addressed, the involvement of the child and family, the monitoring of progress, and the use of evidence-based practice. A consistently cited approach is for a child to receive regular therapy sessions to gradually improve functioning or prevent regression and to supply short specific intensive periods of therapy as required. The literature does recommend that evidence informed interventions are utilised and that therapists monitor the child’s progress towards their goals.

Frequency and Intensity of Therapy

Assessment

A therapist’s understanding of a child’s overall condition can influence the amount and the focus of therapy the child receives. Health status, as well as the type and severity of impairment will impact their current functional skill level and capacity for improvement. There are a number of systems for measuring current functional skill level. For example The Gross Motor Function Classification System (GMFSC) classifies a child’s mobility into five levels from level 1, children walk at home, school, outdoors and in the community to level 5 children are transported in a manual wheelchair in all settings. (9) Another example is the Manual Ability Classification System (MACS) which assesses a child’s ability to handle objects with both hands (10). MACS describes five levels. A child at level 1 handles objects easily and successfully and a child at level 5 does not handle objects and has severely limited ability to perform even simple actions.

Therapies

General Guidance

The intensity and frequency of therapy a child receives is determined by the nature of their individual plan. The treatment plans can differ based on a number of variables such as the age or maturity of a child, the nature of any treatment goals, family preferences, school schedules, or the likelihood that a child will tolerate or benefit from a higher or lower intensity of treatment.(11)

Although much research is being conducted, there is not yet a strong evidence base to support any particular approach to determining optimal levels of therapy for specific disabilities or conditions or for those with complex disabilities. However, a report by Houtrow and Murphy did outline the typical intensity and frequency of therapy sessions, often referred to as the dosing strategy, provided to children with disabilities in the USA at present. (10)

A commonly employed dosage of therapy is around 30-60 minutes per week for a specific period of care, such as throughout the entire school year in the case of school-based therapies. This schedule is often implemented when a child continues to make progress towards their goals and, or, is at risk of experiencing a lack of progress or regression if therapy services were interrupted. Therapeutic interventions may be administered in an intensive manner, involving sessions of 45-60 minutes, two or more times per week. This approach is particularly suitable when there is a short-term goal that can be quickly achieved. Additionally, following a medical event or surgery, some children with disabilities may require intense therapy to regain temporarily lost function before transitioning back to their regular therapy schedule. (11) Bailes and colleagues had previously suggested a recommended frequency of 1-2 sessions per week or every other week for children who consistently show progress toward their goals. (12)

Houtrow and Murphy also examined the prescribing of OT, PT and Speech therapy (SLT) interventions for children with disabilities in the US in accordance with the International Classification of Functioning (ICF) model of disability and health. (11) They produced a clinical report document to serve as a guide for paediatricians and paediatric health providers. The document states that determining the appropriate dose of therapy (how much therapy, how often, and for how long) remains elusive and largely subjective. The report contains a number of case studies, but no definitive answers as to what constitutes a typical therapy schedule. (10)

The American Physical Therapy Association (APTA) highlights a number of dosage considerations for in-school therapy under the Individuals with Disabilities Education Act (IDEA) legislation. Their resource manual suggests that intervention levels can vary based on many factors, including but not limited to; access to in-school support, assistive technology, and clinical expertise. It was suggested that the frequency or intensity of therapy must be adjusted during periods of transition if a child is likely to experience changes in performance or participation, for instance, when moving to secondary school. (13) They also suggest that alternative dosage strategies such as front-loading, therapy blocks, transitional services and or short intensive bursts be used depending on individual need.(14)

Research from the National Institute for Health Research (NIHR) does not provide explicit recommendations as to the frequency or intensity of therapy. Instead, consideration is given to several active ingredients of therapy which influence clinical judgement. They argue that the interventions offered to children with complex disabilities are multifaceted and that several people may be involved in their delivery including the therapist, parents, and school staff. Alternatively, a single therapist may be delivering multiple interventions, or the child’s care may involve other medical or surgical interventions, or the impact of therapy may be moderated by ill health or frailty. The therapy itself can vary according to the general approach, the school or schools of thought, the techniques procedures and, or, equipment provided. Therapists can differ in their knowledge, skills and the actions carried out. For example, clinical decision making, on-going review and assessment, as well as the extent of physical contact or work with the family. Finally, the therapeutic context is informed by the capacity of the wider team, the setting and space, access to equipment and clinical expertise.(15)

This research also found variation in recommendations for different types of activities. For instance, reported frequencies for skeletal loading ranged from 30 minutes five times a week for two months, to twice a day for 30 minutes for six months. While studies on stretching ranged from sessions 3-5 times a week for 4-10 weeks, to 1-2 sessions per week for 9 months.(16)

Specific Guidance

Cerebral Palsy

Palisano conducted a study of 399 children with cerebral palsy (CP) aged 2–6 years old, residing in the United States and Canada to examine the amount and focus of physiotherapy (PT) and occupational therapy (OT) provided to children with CP in the US & Canada.(17) The results showed that a child’s GMFSC rating had a significant impact on the level of intervention received. Children received more minutes of PT and OT per month as their needs increased according to the GMFCS. For example, children at level 1 received an average of 181 minutes per month of PT compared to 320 minutes per month at levels-IV-V This suggests that decision-making takes into account functional abilities, environmental modifications, and equipment needs.

Overall, 70% of parents reported that sessions averaged 30 or 60 minutes. Session length varied based on setting, with sessions in educational settings typically being shorter than those in clinic settings. For example, 73% of parents reported 60-minute PT sessions in clinic compared with 41% reporting 60 minutes sessions in education settings. There were similar findings for OT sessions.(17)

Children who are able to walk (level I) receive the fewest minutes of PT and OT per month because their activity limitations and participation restrictions are less pronounced. According to Palisano, (17) this may be due to the belief that children at level I can achieve their goals with fewer sessions and may have relatively fewer limitations. Interventions for children in levels II-III and levels IV-V place a stronger emphasis on environmental modifications, equipment, and addressing primary impairments compared to interventions for children in level I. The therapy received by children in levels II-III tends to promote independent mobility and focuses more on activities, including instruction in orthotics and mobility devices like canes or walkers, as well as services associated with managing spasticity. Therapy received by children in levels IV-V tends to focus on the need for physical guidance, instruction to family members to optimize positioning and caregiving, environmental modifications, and specialized equipment or assistive technology.

The findings indicate that decisions regarding the frequency and duration of PT and OT for young children with CP are frequently determined by functional abilities.(17)

There was a disparity between therapy received by children in Canada and the USA, where American children receive more PT & OT per month compared with Canadian children. This disparity can be attributed to differences in service systems, particularly the higher percentage of children in the United States receiving services across multiple settings whereas in Canada, publicly funded regional children's rehabilitation programs are the main source of therapy. However, some Canadian children attending kindergarten also receive services in educational settings.

In the United States 34.7% received PT in educational settings only, 19.6% in a clinical setting only and 38.1% in both settings. Whereas in Canada, 16.4% received PT in an educational setting only, 60.4% in clinical settings only, and 20.1% in both settings. There were similar findings for OT. (17) Children in receipt of the most sessions per month were those being seen in both settings.

Palisano acknowledged that determining the most effective frequency, duration, and specific goals of physiotherapy and OT for young children diagnosed with CP presents complex and difficult issues. The perspectives on this matter can differ significantly among families, therapists, administrators, policy makers, and health insurers. The considerable variability in motor abilities and associated health conditions observed in children with CP, along with diverse family requirements, further complicates the decision-making process in this regard. (17)

The NICE guidelines on spasticity management in under 19s recommends that young people with CP should have access to regular sessions with a physiotherapist, OT, and SLT who have experience in managing CP (18). However, the guideline does not provide specific recommendations on how often these sessions should take place. Instead, the frequency of therapy sessions will depend on the individual needs of each young person with CP and may vary depending on factors such as their age, severity of symptoms, and overall health status. Healthcare professionals providing care for young people with CP should work with the individual and their family to develop a personalised care plan that takes into account their specific needs and preferences. This care plan should include recommendations for the frequency of therapy sessions based on ongoing assessments of the young person's progress.

A team from the Cerebral Palsy Alliance Research Institute, University of Sydney, developed clinical practice guidelines for early interventions based on the evidence from systematic reviews for children with or at high risk of developing CP. (19) The guidelines recommend considering several factors when determining the level of intervention for children with or at high risk of CP which include the child's age, severity and type of CP, associated impairments, family preferences, and available resources.

In Norway, Tinderholt et al. (20) conducted a systematic review and meta-analysis of intensive training of motor function and skills among young children with CP. They found that higher intensity therapies defined as either 2–7 sessions per week with additional home training and being tailored to the child’s needs, or those that consisted of more than 1 hour of training per day and were tailored to the child’s needs were found to be the most effective. However, the authors acknowledged that conclusive evidence was not found in relation to optimal intensity and further exploration is required.

Speech Impairments

In relation to children with apraxia[[3]](#footnote-3), the American Speech-Language-Hearing Association’s (ASHA) technical report recommended a higher frequency of early intervention therapy for preschool children to ensure optimal progress.(21) That is, 3-5 times per week, for 30 or 60 minutes, as opposed to once or twice a week. ASHA also recognised that the intensity of treatment must be balanced with other activities to avoid fatigue, especially when a child receives multiple therapy services. They indicated that shorter, more frequent sessions would be preferable to maximise the attention span of younger children. For example, four 30-minute sessions rather than two 1-hour sessions.

Increased intensity may not lead to better outcomes and needs to be balanced to the child’s abilities. Fey et al found that for toddlers with intellectual and communication delay the required frequency and intensity needed to be adapted to the child’s object engagement for their communication training [[4]](#footnote-4). Those who demonstrated more object engagement or meaningful play were more likely to benefit from a higher intensity treatment consisting of 5 weekly one-hour sessions over 9 months. Whereas those who showed less object engagement or meaningful play were more likely to benefit from low intensity treatment which consisted of a once-weekly delivery of the same treatment.

The Royal College of Speech and Language Therapists (RCSLT) issued a position paper challenging the effectiveness of standard six-week therapy blocks for children with disabilities. (23) Researchers had noted that speech therapists in Northern Ireland were using standard protocols of six weekly 30-minute sessions instead of fully implementing evidence-based practice recommendations. (24) The RCSLT called for intervention levels to be informed by evidence-based practice, tailored to meet a child’s individual needs. (23)

There are a number of evidence based interventions for children with speech sound disorders, (25,26) and reviews of the literature found that interventions were typically carried out for 30-60 minutes, 2-3 times a week for an average of 12 months. (27) The Lidcombe program is an example of early intervention for children who stutter. It takes place over multiple stages of at-home treatment, with training, guidance and supervision provided to parents by SLTs. (28) During Stage 1, weekly clinic consultations of 45 minutes are required, while in Stage 2, 30-minute consultations are recommended at increasing intervals from 2-16 weeks. Within this programme duration and intensity can vary and are dependent on several factors including the method of the consultation sessions supplied by SLTs (telehealth, one to one, or group), the severity of the child’s condition, the delivery of the intervention by the parents, and the child’s progress which may be non-linear. Therefore the exact frequency and intensity of sessions is difficult to predict. (29)

Other research in children with speech impairments does suggest that higher session frequency could be beneficial, even when the overall number of sessions remains the same. For example, receiving therapy three times a week for eight weeks, as opposed to once a week for 24 weeks. (30) It is however accepted that there are different components to the dose form there is no “magic number” for session frequency. (31) It has been said that removing a child from school or home to attend therapy without providing sufficient dosage to effect change is unethical. However, the dosage that would effect change remains difficult to calculate.

Population level estimates in the UK in 2010 suggested that an additional 15 hours of SLT therapy provided to children with speech impairments aged 6-10 years over 15 weeks would offer a potential a net gain of more than £700 million based on improved lifetime earnings. For children with autism aged 2-4 years, 36 hours of additional SLT therapy over six months could generate a net gain of £9.8 million based on reduced service use and an increase in family productivity as a result of better communication and independence. (32)

Autism

Following a review of the literature, Prior and Roberts (33) recommend 15-25 hours per week of learning-based intervention for children with autism under the age of seven. This can include behavioural interventions such as Applied Behaviour Analysis (ABA)[[5]](#footnote-5), developmental interventions such as Picture Exchange Communication System (PECS), combined interventions such as TEACCH®[[6]](#footnote-6) and others, such as music therapy. This recommendation was echoed by Roberts and Williams (34) who suggested that intervention levels should be evaluated regularly and modified on an individual basis, with regard to a child’s skills, needs and goals.

Salomone et al. (35) conducted a European survey in relation to the use of early intervention, received at home, school and clinic, for young children with autism spectrum disorder. Parents of children with ASD, aged 7 years or younger, were recruited for this study through parent organizations in 18 European countries. The 18 countries were grouped for analysis into four regions as defined by the United Nations; Western Europe, Northern Europe (includes Ireland) Eastern Europe and Southern Europe. According to the study, there is considerable variation in the use of interventions for autism spectrum disorder across Europe with significant differences in the number of hours of therapy that were received per week, which ranged from 6.94 hours in Western Europe to 10.26 hours in Northern Europe (overall mean=9 hours). The number of parents who reported they were not currently using any intervention ranged from 1.3% in Poland to 29% in Ireland. The most frequently reported interventions were speech and language therapy (64%) and behavioural, developmental, and relationship-based interventions (55%). The study highlights the need for a more homogeneous set of services and greater awareness of evidence-based practices across Europe.

When considering the level of intervention for children with autism in the UK, the NICE guidelines for Autism Spectrum Disorder in under 19s, recommends intensive early intervention programs for preschool children with autism, such as the Early Start Denver Model (ESDM) or ABA.(36) However, the guideline does not provide specific recommendations on the intensity of these programs. The guidelines acknowledge that the intensity of early intervention programs may vary depending on the individual needs of each child or young person with autism and should be determined by a comprehensive assessment of their strengths, difficulties, and developmental level. The guidelines also recommend group-based parent training intervention to identify triggers and patterns of reinforcement, social communication interventions for school-aged children with autism, such as Social Stories or Comic Strip Conversations, cognitive behavioural therapy (CBT) for anxiety or depression, and sensory integration therapy to address sensory processing difficulties in children with autism.

ESDM is an early intervention approach for children with autism aged 12-48 months, which can be delivered by trained therapists and parents. (37) ESDM is a combination of ABA combined with developmental science and some of the key approaches are play based learning, developmental relationships and intensive structured teaching. Waddington et al. considered a low intensity form of the ESDM in Australia and New Zealand with four children. Their study evaluated the effects of a 12-week parent coaching followed by 12-weeks of therapist-delivered ESDM intervention for four children with ASD. During the therapist delivered ESDM intervention phase, the children were seen twice a week for 12 weeks, with each session lasting for 1 hour. Participation consistently increased when both parents and therapists utilized ESDM techniques, and the levels of participation were similar during the parent coaching and direct therapy phases. Children showed greater imitation with the therapist but showed minimal improvement in functional utterances. These findings suggest there maybe some benefit to low intensity therapy and parent coaching. (38)

Child & Family Involvement

Research shows that the child and their family play an important role in determining the frequency or intensity of therapy received.

There is evidence to suggest that shortfall in the provision of therapies could be addressed by parental training and twice weekly home practice sessions. (39) Houtrow and Murphy acknowledged that strong collaboration between the family, treating therapists, specialists, and the child's primary care provider is vital for identifying optimal dosing strategies that consider the child's health, current functional status, goals, readiness for therapy and response to intervention.(11)

Houtrow and Murphy’s guidelines emphasize the importance of involving parents in intervention programs and tailoring interventions to the child's specific needs and abilities. They recommend daily repeated practice for skills acquisition and refinement and suggest parental coaching to structure practice beyond scheduled therapy sessions for adequate dosing. The exact frequency and duration of therapy may vary depending on the individual needs of the child.(11)

Strong collaboration between families and other stakeholders was advocated for by Aranbarri et al. (40) who investigated the service delivery practices of early intervention programmes in relation to children with autism in the US. A total of 133 participants took part in the study, including early intervention state coordinators, agency administrators, early intervention providers, and caregivers of children with autism. The study found that about half of the children received fewer than 6 hours of intervention per month. Children from families with higher income were more likely to receive more than 15 hours per month of intervention. The study also found that most services were provided in the home, and it is likely these were provided using a one-to-one provider to child ratio. They acknowledged that early intervention goals were based on child and family needs, and the most frequent method to establish intervention goals was through collaboration with caregivers.

Ganotti et al. (16) developed a pathway model which draws on the ICF framework to determine the dosage parameters for children with CP. It outlines key considerations for therapy frequency and intensity. Family members’ emotional and behavioural response to the condition can influence intervention levels. Additional factors include socio-economic status and the dynamic nature of child-caregiver interactions. At a community level, factors include access to social supports, respite, accessible transport, buildings, and after-school activities. Most importantly, intervention levels are informed by child characteristics such as age, severity of impairment or comorbidities, as well as personal preferences and “readiness for change.”

Monitoring

It is necessary to monitor children with disabilities on an on-going basis, to determine the effectiveness of any therapy plan and make adjustments to the frequency or intensity accordingly. Goals can be established and subsequently monitored through observation of child’s skills and behaviour or using a specific assessment.(40)The ICF is one way to measure changes across the domains of bodily structure and function, activity, and participation.(41)

Children who have reached a stable level of functionality and have accomplished their current functional goals may only require periodic or intermittent therapy services. This is particularly applicable to older children who have likely achieved most of their developmental milestones. In cases where children with disabilities demonstrate proficient use of adaptive equipment, their therapy needs may be limited to occasional check-ups, with additional short-term, intensive therapy sessions necessary when new equipment is acquired to ensure proper training with the device. The process of therapeutic surveillance also holds great significance, as children with disabilities are prone to skill regression or lack of progress due to changes in their health or environments. Promptly reengaging therapy services can help prevent a decline in participation and overall quality of life. Similarly, a child enrolled in a long-term therapeutic treatment program may require an increase in services when a new issue arises, or a goal is identified based on changes in functional status or developmental expectations. This sudden alteration in therapy requirements is commonly referred to as a "burst" or an "episode" of therapy. (8)

Evidence-Based Practice

Evidence-based practice can support decision-making with regard to treatment plans for children with disabilities and is a key aspect of maintaining a quality service. (42–44) Best practice advice and guidance is available from professional bodies and other organisations. Examples of these include the Association of Occupational Therapists of Ireland (AOTI) or the Irish Association of Speech and Language Therapists (IASLT).

Discipline-specific databases exist which facilitate evidence searches based on relevant criteria. For example, Speech and Language UK host the What Works database which is a database of evidenced interventions to support children’s speech, language and communication skills.(45) Speech BITE is a speech and language database supported by the RCSLT and Speech Pathology Australia.(46)

Two Australian Universities host OTseeker which is a database that contains abstracts of systematic reviews, randomised controlled trials and other resources relevant to OT interventions.(47)

PEDro is a physiotherapy database, hosted by the Institute for Musculoskeletal Health at the University of Sydney and Sydney Local Health District containing 62,000 trials, reviews and guidelines evaluating physiotherapy interventions.(48)

A team of social psychologists host the Wise database of psychological interventions. The interventions are from a particular school of psychology and focus on the meanings and inferences people draw about themselves, other people, or a situation they are in.(49)

Aranbarri et al. (40) puts forth various recommendations for enhancing the incorporation of evidence-based practices into publicly funded early intervention services for children with autism in the United States. These recommendations encompass several implementation strategies:

1. Provision of increased resources and training opportunities for providers and leaders, aiming to foster a more favourable implementation climate and attitudes toward evidence-based practices for Autistic Spectrum Disorder (ASD).
2. Development and implementation of clear policies and practices outlining the specific type and intensity of early intervention services for young children with ASD.
3. Enhanced utilisation of ASD-specific evidence-based practices, with a particular emphasis on integrating high-quality caregiver coaching into interventions.
4. Active involvement of caregivers as an integral part of the intervention process, recognising their crucial role in supporting the child's progress.
5. Advancement of state system support to ensure broader access to high-quality ASD specific practices, particularly in areas with limited resources.
6. Utilisation of implementation science to identify the determinants of delivering high-quality early intervention services and to develop effective strategies for their implementation.

By implementing these recommendations, the study anticipates improvements in the translation and delivery of evidence-based practices within publicly funded early intervention services for children with ASD in the United States.

The Royal College of Occupational Therapists (RCOT) have published a number of evidence-based summaries, which offer guidance for the frequency and intensity of support if using particular interventions. (50) These include home programmes for children with intellectual disability and CP, and the Cognitive Orientation to Daily Occupational Performance (CO-OP) approach for children with Developmental Coordination Disorder. They also provide guidance in relation to family-centred practice, parent-caregiver coaching and occupation-focused interventions for specific groups.

The Children’s Trust has released a number of evidence-based summaries which offer key considerations as to the effectiveness of different types of rehabilitation for children with acquired brain injuries. These include therapies to improve gross motor function and upper limb function. Recommendations as to intensity or frequency of therapy are made with regard to the use of standing frames, strength training, treadmill walking and upper limb neuromuscular and muscular electrical stimulation (NMES) (51).

Conclusion

Limitations

This review was limited to papers that were written in English. As such, international insights into the formulation of intervention levels may have been missed. Further research into services and interventions in non-English speaking countries should be conducted. Furthermore, the review focused on the frequency and intensity of therapies. However, outcomes for children with disabilities can vary based on wider supports and contextual factors which this review did not consider and therefore, should be taken into account when considering the ideal intervention for a child with a complex disability.

Considerations for determining intervention or therapy levels

When determining how the level of intervention or therapy a child receives is calculated the literature suggest the following should be taken into consideration:

* Conduct thorough assessments: Begin by conducting comprehensive assessments of the child's condition, including their physical, cognitive, and emotional capabilities, as well as their specific needs and goals. This assessment should involve input from various professionals, such as therapists, psychologists, and educators, to obtain a holistic understanding of the child's abilities and challenges;
* Individualise treatment and intervention plans: Develop individualised treatment plans which appreciate the unique characteristics of the child, their condition, and their family's preferences and goals. Recognize that each child may require a different level of intervention based on their specific needs and abilities;
* Involve the child and family: Include the child and their family in the decision-making process. Seek their input, preferences, and goals to ensure that the chosen level of intervention aligns with their expectations and values. Collaboration and open communication with the family are essential for determining the appropriate therapy level;
* Monitor progress continuously: Implement a system for ongoing monitoring and evaluation of the child's progress. Regularly assess their response to therapy and their functional outcomes to determine whether the current level of intervention is effective or if adjustments need to be made; and
* Consult evidence-based guidelines: Consult existing evidence-based guidelines and research studies when determining the appropriate level of intervention. While the research in this area may be limited, it is important to rely on the available evidence to guide decision-making and inform treatment choices and frequency of interventions.

Ultimately, determining the appropriate level of therapy for children with disabilities poses significant challenges due to the wide variation in presentations resulting from different conditions. Each disability comes with its unique set of characteristics and requirements, making it difficult to establish a one-size-fits-all approach. Moreover, the lack of consensus among experts and professionals regarding the optimal intensity of therapy further compounds the challenge. The scarcity of well-designed research studies focusing on therapy intensity in children with disabilities limits the availability of evidence-based guidelines, what evidence there is has found that children can benefit from specific protocols which have been designed or adapted for their use. The individuality of each family and their specific goals for intervention contribute to the complexity of finding the right therapy level. Recognising and addressing these challenges is crucial to ensure that children with disabilities receive interventions tailored to their specific needs, family dynamics, and desired outcomes. Further research, collaboration among professionals, and a holistic approach that considers the individual needs of each child are necessary to overcome these challenges and optimise therapy levels for children with disabilities.

Further Research

The evidence available was generally focused on one age group or impairment type and interventions that were provided by professionals operating with a single discipline approach. To widen the evidence base it is important to provide evidence around treatment efficacy for children with complex or multiple disabilities where multiple therapists are providing interventions in a real world environment.

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1. <https://nda.ie/publications/nda-advice-paper-on-disability-language-and-terminology> [↑](#footnote-ref-1)
2. This is the number of opportunities a child has to engage in a targeted activity. For example, hearing or speaking a specific word during SLT. [↑](#footnote-ref-2)
3. Children with apraxia have difficulty controlling their lips, jaws and tongue when speaking. [↑](#footnote-ref-3)
4. Milieu training is a practice of arranging stimuli or manipulating the environment to encourage a child to engage in a targeted behaviour. [↑](#footnote-ref-4)
5. It must be noted that some of the therapies within this review are opposed by members of the autistic community and their representative organisations. For more information see: <https://asiam.ie/advice-guidance/faqs> [↑](#footnote-ref-5)
6. TEACCH® is an acronym for Treatment and Education of Autistic and related Communication-handicapped Children. The programme was developed in the USA where the word handicapped is still occasionally used to refer to people with disabilities. However, the programme is mainly known only by the acronym. [↑](#footnote-ref-6)