THE ALLIED HEALTH SCHOLAR

# Weekly versus fortnightly Allied Health early intervention for children with diagnosed/suspected developmental delay

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## Abstract

**Aim and background:** Reviewing service provision is prudent for early childhood development teams to ensure efficient and high quality service delivery. The context of this study is an outpatient, clinic-based, Allied Health Early Intervention service, for children, aged 1-4years with diagnosed/suspected developmental delay and their families, which is currently provided fortnightly over 10-weeks. This study aimed to compare the impact on carer and clinician preferences, client outcomes and efficiencies such as attendance rates, of weekly versus fortnightly clinics. **Methods:** A prospective multi-informant, group comparison design was conducted comparing fortnightly interventions over 10-weeks and weekly interventions over 5-weeks. Intervention outcome data (Canadian Occupational Performance Measure), attendance rates and questionnaire data completed by clinicians and carers, were compared between the two frequency periods. **Results:** No statistically significant difference was found between both models for overall attendance rates or outcome measures (n=25 fortnightly, n=29 weekly). Carers' (n=97) and clinicians' (n=36) perceptions showed a variety of preferences. Carers suggested weekly was preferable for children who function well with routine, have shorter term goals and homework and for rapport building. Concerns for vulnerable families

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regarding a shorter contact period of 5-weeks with the weekly service, compared to 10-weeks (for fortnightly service), were identified by clinicians. Consistent feedback from carers was weekly over 10-weeks as the best option. Clinician themes included perception of increased workload with weekly and additional time needed to observe change for some children. Carers for both models articulated practical attendance barriers.

**Conclusions:** A flexible model of service frequency is recommended, to suit the needs of children and carers, aligning with clinicians' clinical reasoning. Decision making considerations should include condition, type of therapy (need for intensity/longer period/routine/relationship building), family practicalities, family vulnerability and benefits of service contact time.

**Keywords:**

Early Intervention, Service Frequency, Developmental Delay, Allied Health

## Introduction

The benefits of early intervention for children with diagnosed/suspected developmental delay are well established, with research demonstrating how early intervention services can improve developmental outcomes and reduce or minimise the long-term impact of impairment (Paul & Roth, 2011). Furthermore, timing of early intervention is considered imperative with acknowledgement that the earlier access to intervention the better the outcome (Peacock-Chambers, Ivy & Blair-Merritt, 2017; Paul & Roth, 2011).

The primary goal of any form of early intervention is to improve the developmental trajectory of the child (Paul & Roth, 2011; Peacock-Chambers et al., 2017). Within the primary health care realm, the focus of early intervention is on the provision of direct therapeutic services to infants and young children and their caregivers, with an overarching aim to improve developmental outcomes (Kingsley & Mailloux, 2013; Peacock-Chambers et al., 2017). Whilst there is a large degree of heterogeneity in early intervention approaches, research has shown that programs which are child-centred, structured, intensive and conducted over a longer duration offer the most benefit (Majnemer, 1998). Phillips and Shonkoff (2000) renowned authors in the area of early intervention, adds goal focused, individualised services, tailored to child's specific needs and a mix of models, amongst other principles.

Generally, access to early intervention services is dependent on the developmental profile of the child, with those demonstrating more severe delays in development, accessing a broader range of services at a higher frequency for a longer duration (Woodman, Demers, Crossman, Warfield, & Hauser-Cram, 2018). Early intervention services within the community setting are generally offered on a weekly basis with a combination of weekly and bi-weekly sessions conducted in the acute care setting (Majnemer, Shevell, Rosebbaum & Abrahamowicz, 2002). However, this is not consistently applied across settings, with the determination of intervention dosage and frequency dependent on health service policies or on individual clinicians, in accordance with clinical reasoning, knowledge and experience (Gee, Lloyd, Devine, Tyrrell & Evans, 2016).

It has been suggested that children with intellectual difficulties and/or language delay learn more efficiently when provided with opportunities for teaching over several sessions rather than fewer, longer sessions (Warren, Fey & Yoder, 2007). Research demonstrates that these children do not learn, generalise and maintain targeted skills when provided with massed practice at once rather than more distributed practice, despite a similar cumulative intervention intensity (Warren et al., 2007). However, despite accessing an increasing frequency of intervention, these same children may demonstrate lower overall gains due to the nature of their initial developmental difficulties (Woodman et al., 2018).

Subsequently within this context, allied health clinical teams need to ensure that service provision reflects up to date best practice and that programs delivered, are not only efficient but are of high quality designed to maximise children’s ability to reach their potential (Fillis, Dunne & McConnell, 2017; Kingsley & Mailloux, 2013). In addition, there is an increasing need to focus on ensuring current intervention approaches are maximised to achieve efficiency, which is linked to intervention frequency (Fey, Yoder, Warren & Bredin-Oja, 2013).

The focus of this current study is an outpatient-based early intervention service, based in northern Adelaide, Australia, to children presenting with developmental delay. The majority of children accessing the service are aged between 1 and 4 years of age from the northern suburbs, where families are from poorer socio-economic background with often generational compound disadvantage and vulnerabilities. For 24% of clients accessing the service, their provision of care is under the ‘guardianship of the Minister’ whereby the client (child) has a vulnerable home situation/environment and there is a partnership between the government minister via a government agency and a nominated carer to ensure that the child’s care needs are met. Families are from varying cultural backgrounds with 4% from Aboriginal and Torres Strait Islander populations, and many families where English is a second language.

The service incorporates Speech Pathology, Occupational Therapy, Social Work, Dietetics and Physiotherapy. The team provides assessment and blocks of therapy where appropriate for children with confirmed or suspected developmental delays (e.g. speech and language, fine motor skills, mobility issues, fussy eating, sleep issues, child-parent interaction issues etc.) prior to the commencement of preschool. Following assessment, the service offers individual discipline therapy blocks, multidisciplinary therapy blocks and group therapy, with both individual discipline and multidisciplinary therapy blocks currently offered on a fortnightly basis during each school term.

Management and staff identified concerns with the current fortnightly therapy model, including consistently high failure to attend rates; complexities in the administration of client appointments; variable clinical effectiveness suspected to be influenced by the service model; clinicians spending significant time reviewing and planning for sessions where session can be up to 14 days apart; family dissatisfaction with frequency of intervention from consumer feedback evaluation, as well as increased difficulties coordinating multidisciplinary services.

This study aimed to investigate the effect of an early intervention service comparing weekly and fortnightly frequency of intervention, considering both perceived clinical outcomes and attendance rates for clients and perspectives of carers and clinicians in relation to preferences and efficiency of service.

More specifically, the research explored the following questions:

1. When comparing a weekly based allied health paediatric service to a fortnightly service for children with developmental delay:
    a) Is there an impact of service frequency on attendance rates?
    b) What are the benefits and challenges of each frequency model to the clinician's workload?
2. What are carer preferences for service frequency of allied health paediatric services?
3. Is there a difference in perceived service outcomes for clients receiving weekly or fortnightly service?

## Method

This study employed a multi-informant, group comparison design. The study spanned three different sites where the Early Intervention Service provides blocks of therapy intervention. During School Term 2, the fortnightly intervention delivery model was maintained (called "Intervention Period 1") and during School Term 3, the intervention was provided weekly (called "Intervention Period 2"). Three types of participants, clients, carers (i.e. parent, guardian, family member attending the appointments) and clinicians were included in the study.

Client inclusion criteria included experiencing delay in one or more areas of development (e.g. speech, cognition, social skills, motor skills); aged 4 years 11 months or less (at commencement of the study); and receiving a block of therapy service. The therapy services offered included Speech Pathology individual service, Occupational Therapy individual service, Social Work individual service, Speech Pathology and Occupational Therapy multidisciplinary service, Social Work and Speech Pathology multidisciplinary service or Social Work and Occupational Therapy multidisciplinary service. Exclusion criteria included receiving group intervention only; and receiving one-off service and not a block of therapy. Physiotherapy and Dietetic services within the team were excluded in this study as they primarily offer one-off services.

This study received ethics approval from CALHN Human Research Ethics Committee (HREC/19/CALHN/145) and University of South Australia (Application ID: 202219) and governance approval from Northern Adelaide Local Health Network (SSA/18/NALHN/124) and was conducted in full conformance with principles of the “Declaration of Helsinki”, Good Clinical Practice (GCP) and within the laws and regulations of Australia. Clinicians were provided information about the study at their monthly service staff meeting by a member of the research team with further information and consent forms sent via email following this meeting. To avoid risk of coercion, members of the research team that were line managers did not recruit clinicians for the research. Informed consent was obtained from all participants. For all client (child) participation, this consent was obtained from their carers.

The outcomes collected included client attendance rates and their perception of their performance and satisfaction in self-care, productivity and leisure activities pre and post intervention via the Canadian Occupational Performance Measure (COPM), (Law, Baptiste, McColl, Opzoomer, Palatajko & Pollock, 1990), both of which were collected as part of the services usual data collection. A comparison of scores between the two intervention periods was made. Perspectives of clinicians and carers of the attending children via questionnaires after each intervention period were also collected.

The COPM was selected to capture data related to the International Classification of Functioning domain for client participation before and after each intervention period and was already being used by the service prior to this study. The COPM aims to evaluate outcomes based on a child's individual goals throughout the intervention period. The clinician completes the COPM with the carer where 3-5 goal areas are identified and rated current level and satisfaction of performance from 1 to 10. This is repeated by the clinician with the carer at the conclusion of the intervention period. The COPM has strong test-retest reliability and construct validity (Law et al., 1990). A change of 2 points has been shown to be clinically meaningful. The COPM has been widely used in research, including in the paediatric population, as an outcome measure and is an ideal tool to capture a variety of intervention goals, specific to each client (Jackman, Novak, Lannin, Froude, Miller & Galea, 2018).

Potential client and carer participants who met the inclusion criteria were invited by their treating clinician to participate in the study verbally at their pre intervention service appointment. Clinicians notified the researcher of potential participants (who had consented) to receive further information from the research team. A principal investigator (independent from service provision) contacted the participant to provide further information and complete informed consent in person, prior to therapy block commencing.

Consented carers and clinicians completed a questionnaire on their perspectives at the end of each of the relevant intervention periods.

The clinician and carer questionnaires were self-developed for the purpose of collecting information related to the two intervention frequencies. The carer questionnaire consisted of 14 questions regarding attendance, engagement, homework/strategy implementation and overall experience with the service. A four-point Likert scale scoring system was used consisting of strongly agree, agree, disagree and strongly disagree ratings. These were followed by four open ended questions to obtain further information on any general difficulties attending therapy sessions during the term; how the frequency of therapy sessions impacted ability to attend sessions; how the frequency of therapy sessions impacted ability to implement therapy activities at home; and how the frequency of therapy sessions impacted the child's engagement and progress in therapy. The clinician questionnaires consisted of nine questions addressing preparation and planning, homework/strategy implementation, rapport building and workload and the same four point Likert scale scoring system was used. These were followed by four open ended questions that addressed how the frequency of therapy sessions impacted the booking of blocks of therapy; how the frequency of therapy sessions impacted the attendance of clients; how the frequency of therapy sessions impacted the engagement of the clients in therapy sessions; and the impact of the frequency of therapy sessions on workload and/or provision of therapy.

A minimum sample size of 50 carers and 20 clinicians for the questionnaires per intervention period was sought to ensure a representative sample. For the COPM, a sample size of 25 children per term was sought, based on 80% power to detect a mean difference of two or greater (the clinically important difference as per Law et al. 1990) between the weekly and fortnightly service models, assuming a standard deviation of 2.5 for each of the COPM scales (Miller, Polatajko, Missiuna, Mandich & Macnab, 2001).

### *Data Analysis*

Descriptive statistics (means and standard deviations and proportions) were used to describe the characteristics of the study population, change in performance and change in satisfaction on the COPM in each term, attendance proportions and responses to the carer and clinician questionnaires. Differences between change in performance and in satisfaction on the COPM were analysed using independent samples t-tests. Chi-square tests were used to examine whether responses to the carer and clinician questionnaires differed between periods. A two-sided p-value of <0.05 was considered statistically significant. Stata (version 15.1, College Station, Texas) was used for all analyses. Open-ended questions in the questionnaires were analysed thematically, with two researchers involved in confirming the themes. Triangulation between carer and clinician data was utilised to provide a multi-informer view.

## Results

### *Descriptive information of participants*

Carers of children aged between 2 years and 0 months and 4 years and 10 months with a mean age of 3 years 5 months, from the low socio-economic catchment area of the service (i.e. northern and north-eastern suburbs of Adelaide), participated in the study. The relevant clinical experience of the clinician participants varied between 4-37 years with a mean of 14.6 years of experience working with the paediatric population with diagnosed/suspected developmental delay.

### *Change in performance and change in satisfaction on the COPM*

In period 1 (fortnightly interventions), 271 children received intervention with the service. Twenty-five (mean age = 3.4 years, range = 2.2 to 4.4 years) had complete data recorded for pre and post COPM.

In period 2 (weekly interventions), 284 children received intervention with the service. Twenty-nine (mean age = 3.2 years, range = 2.1 to 4.2 years) had complete data recorded for pre and post COPM. Four children had COPM results recorded for period 1 and period 2.

There were no statistically significant or clinically significant differences between Intervention Periods 1 and 2 for mean change in performance (1.8 and 1.4 in Periods 1 and 2, respectively) or mean change in satisfaction (1.8 and 1.4 in Periods 1 and 2, respectively) overall or for specific therapy types or locations (Table 1).

**Table 1 Mean change in performance and mean change in satisfaction on the COPM in Period 1 and 2 overall and by therapy type and location**

| | Period 1 | | | Period 2 | | | Difference (P2-P1) | |
|---|---|---|---|---|---|---|---|---|
| | | ean | D | | ean | D | Mean (95% CI) | p-value |
| **ALL** | | | | | | | | |
| Change in Performance | 5 | .8 | .3 | 9 | .4 | .3 | -0.4 (-1.1, 0.3) | 0.299 |
| Change in Satisfaction | 5 | .9 | .5 | 9 | .4 | .6 | -0.5 (-1.3, 0.4) | 0.300 |
| **BY THERAPY TYPE** | | | | | | | | |
| **Speech Therapy** | | | | | | | | |
| Change in Performance | 9 | | .3 | 9 | .3 | .1 | -0.4 (-1.2, 0.4) | 0.344 |
| Change in Satisfaction | 9 | .9 | .5 | 9 | .6 | .4 | -0.3 (-1.3, 0.7) | 0.529 |
| **Occupational Therapy** | | | | | | | | |
| Change in Performance | | .1 | .8 | 1 | .1 | .6 | 0.1 (-1.7, 1.9) | 0.934 |
| Change in Satisfaction | | .2 | .1 | 1 | .4 | .0 | 0.2 (-2.1 2.5) | 0.850 |
| **Social Work** | | | | | | | | |
| Change in Performance | | .3 | .1 | | .8 | .2 | 1.4 (-1.1, 3.9) | 0.219 |
| Change in Satisfaction | | .6 | .8 | | .8 | .2 | 0.2 (-3.5, 4.0) | 0.881 |
| **BY LOCATION** | | | | | | | | |
| **Location 1** | | | | | | | | |
| Change in Performance | | .8 | .8 | | .2 | .9 | 0.5 (-1.1, 2.1) | 0.547 |
| Change in Satisfaction | | .3 | .8 | | .8 | .9 | 0.5 (-1.9, 2.8) | 0.658 |
| **Location 2** | | | | | | | | |
| Change in Performance | 4 | .9 | .6 | 0 | .3 | .1 | -0.6 (-1.6, 0.3) | 0.181 |
| Change in Satisfaction | 4 | .0 | .8 | 0 | .5 | .2 | -0.6 (-1.6, 0.5) | 0.265 |
| **Location 3** | | | | | | | | |
| Change in Performance | | .2 | .7 | | .6 | .0 | -0.6 (-2.6, 1.4) | 0.426 |
| Change in Satisfaction | | .7 | .7 | | .5 | .9 | -2.2 (-5.3, 0.9) | 0.115 |

### *Attendance*

Overall attendance proportions were similar in Intervention Period 1 (85.6%) and Period 2 (84.3%) (Table 2). When looking at specific therapy types, attendance was higher in Period 2 (90.2%) for occupational therapy than for Period 1 (80.1%) but similar between the Periods for speech pathology and social work (Table 2).

**Table 2 Attendance Proportions in Periods 1 and 2 overall and by type and location**

| | Period 1 | | Period 2 | | P-value from chi-square test | |
|---|---|---|---|---|---|---|
| | **N** | **%** | **N** | **%** | **Overall distribution** | **Attended vs DNA/SDC** |
| **OVERALL** | | | | | | |
| **Attended** | 722 | 85.6 | 942 | 84.3 | | |
| **Did Not Attend (DNA)** | 38 | 4.5 | 77 | 6.9 | | |
| **Same Day Cancellation (SDC)** | 83 | 9.8 | 98 | 8.8 | *0.069* | |
| ***DNA + SDC*** | 121 | 14.4 | 175 | 15.7 | | *0.421* |
| **BY THERAPY TYPE** | | | | | | |
| ***Speech Pathology*** | | | | | | |
| **Attended** | 434 | 88.9 | 536 | 87.6 | | |
| **Did Not Attend (DNA)** | 11 | 2.3 | 31 | 5.1 | | |
| **Same Day Cancellation (SDC)** | 43 | 8.8 | 45 | 7.4 | *0.041* | |
| ***DNA + SDC*** | 54 | 11.1 | 76 | 12.4 | | *0.490* |
| ***Occupational Therapy*** | | | | | | |
| **Attended** | 185 | 80.1 | 294 | 90.2 | | |
| **Did Not Attend (DNA)** | 11 | 4.5 | 12 | 3.7 | | |
| **Same Day Cancellation (SDC)** | 35 | 15.2 | 20 | 6.1 | *0.001* | |
| ***DNA + SDC*** | 46 | 19.9 | 32 | 9.8 | | *0.001* |
| ***Social Work*** | | | | | | |
| **Attended** | 260 | 81.0 | 363 | 77.9 | | |
| **Did Not Attend (DNA)** | 27 | 8.4 | 46 | 9.9 | | |
| **Same Day Cancellation (SDC)** | 34 | 10.6 | 57 | 12.2 | *0.574* | |
| ***DNA + SDC*** | 61 | 19.0 | 103 | 22.1 | | *0.293* |
| **BY LOCATION** | | | | | | |
| ***Location 1*** | | | | | | |
| **Attended** | 230 | 79.9 | 270 | 83.6 | | |
| **Did Not Attend (DNA)** | 18 | 6.3 | 16 | 5.0 | | |
| **Same Day Cancellation (SDC)** | 40 | 13.9 | 37 | 11.5 | *0.488* | |
| ***DNA + SDC*** | 58 | 20.1 | 53 | 16.4 | | *0.233* |
| ***Location 2*** | | | | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Attended** | 318 | 91.9 | 336 | 86.8 | | |
| **Did Not Attend (DNA)** | 5 | 1.4 | 16 | 4.1 | | |
| **Same Day Cancellation (SDC)** | 23 | 6.6 | 35 | 9.0 | *0.042* | |
| ***DNA + SDC*** | 28 | 8.1 | 51 | 13.2 | | *0.050* |
| ***Location 3*** | | | | | | |
| **Attended** | 174 | 83.3 | 336 | 82.6 | | |
| **Did Not Attend (DNA)** | 15 | 7.2 | 45 | 11.1 | | |
| **Same Day Cancellation (SDC)** | 20 | 9.6 | 26 | 6.4 | *0.134* | |
| ***DNA + SDC*** | 35 | 16.7 | 71 | 17.4 | | *0.828* |

### *Questionnaires: quantitative results*

In Period 1, 50 carers received the questionnaire, with 49 completed responses returned (providing a response rate of 98%; mean age of carers' children = 3.4 years, range = 1.9 to 4.5 years). In Period 2, 48 carers received and completed the questionnaire (providing a response rate of 100%; mean age of carers' children = 3.4 years, range = 2.0 to 4.8 years). Ten carers participated in the questionnaire for both period 1 and period 2.

Responses to items on the carer questionnaire were broadly similar in both intervention periods, although carers were more likely to strongly agree they were able to remember the times for each therapy session in Period 2 than in Period 1 (93.6% in Period 2 versus 75.5% in Period 1, $p = 0.015$) (Table 3).

In Period 1, 20 clinicians were involved in interventions and 18 clinicians returned completed questionnaires (providing a 90% response rate) and in Period 2, 19 clinicians were involved, with 18 completed questionnaires returned (indicating a response rate of 95%). Clinicians (n = 18) for both periods were more likely to agree and/or strongly agree in Period 1 than in Period 2 that: they had adequate time to prepare for each therapy session; the frequency of therapy sessions was appropriate to plan and progress treatments; they were able to provide carers with strategies to interact/play/support the child for the period until their next visit; it was their impression that carers had enough time in between therapy sessions to implement therapy suggestions; and were able to adequately manage their overall workload (Table 3).

### ***Questionnaires: qualitative findings***

Themes that emerged from the open-ended responses on the carer and clinician questionnaires were grouped into the positive and negative insights.

**Table 3 Responses to the Carer and Clinician Questionnaire in Periods 1 and 2**

| | Period | n | Strongly Disagree (%) | Disagree (%) | Agree (%) | Strongly Agree (%) |
|---|---|---|---|---|---|---|
| **CARER** | | | | | | |
| **1. I was given enough notice prior to the commencement of therapy sessions to arrange for our attendance** | **1** | 49 | 0 | 6.1 | 18.4 | 75.5 |
| | **2** | 48 | 4.2 | 2.1 | 20.8 | 72.9 |
| **2. The information I received about the time for therapy appointments was adequate** | **1** | 49 | 2.0 | 0 | 18.4 | 79.6 |
| | **2** | 48 | 0 | 2.1 | 25.0 | 72.9 |
| **3. I was able to remember the times for each of the therapy sessions** | **1*** | 49 | 0 | 0 | 24.5 | 75.5 |
| | **2*** | 47 | 0 | 0 | 6.4 | 93.6 |
| **4. The frequency of therapy sessions were achievable to attend** | **1** | 49 | 0 | 4.1 | 24.5 | 71.4 |
| | **2** | 48 | 0 | 0 | 22.9 | 77.1 |
| **5. I was able to remember the ideas/suggestions given to me between each of the therapy sessions** | **1** | 49 | 0 | 2.0 | 42.9 | 55.1 |
| | **2** | 48 | 0 | 2.1 | 29.2 | 68.8 |
| **6. I was able to incorporate the ideas/suggestions given to me into our home routine** | **1** | 49 | 0 | 4.1 | 46.9 | 45.0 |
| | **2** | 47 | 0 | 2.1 | 29.8 | 68.1 |
| **7. My child remained motivated with therapy activities at home in between booked sessions** | **1** | 49 | 0 | 20.4 | 53.1 | 26.5 |
| | **2** | 47 | 2.1 | 14.9 | 55.3 | 27.7 |
| **8. The frequency of therapy sessions fit in with our other family commitments** | **1** | 49 | 0 | 6.1 | 22.4 | 71.4 |
| | **2** | 48 | 0 | 10.4 | 31.2 | 58.3 |
| **9. I felt at ease to ask questions to the therapist(s)** | **1** | 49 | 0 | 0 | 18.4 | 81.6 |
| | **2** | 48 | 0 | 0 | 10.4 | 89.6 |
| **10. I felt the experience with the members of the Children's and Family team was positive for the child** | **1** | 49 | 0 | 4.1 | 12.2 | 83.7 |
| | **2** | 48 | 0 | 0 | 10.4 | 89.6 |
| **11. I felt my own experience as carer with the members of the Children's and Families team was a positive one** | **1** | 49 | 0 | 6.1 | 14.3 | 79.6 |
| | **2** | 48 | 0 | 0 | 6.2 | 93.8 |
| **12. In my experience, the frequency of therapy sessions was appropriate for the child in my care** | **1** | 49 | 0 | 12.2 | 40.8 | 46.9 |
| | **2** | 48 | 0 | 6.2 | 25.0 | 68.8 |
| **13. In my experience, the frequency of therapy sessions was appropriate for me as carer** | **1** | 49 | 0 | 8.2 | 36.7 | 55.1 |
| | **2** | 48 | 0 | 4.2 | 33.3 | 62.5 |
| **14. I was satisfied with the service I received** | **1** | 49 | 0 | 2.0 | 16.3 | 81.6 |
| | **2** | 48 | 0 | 0 | 27.1 | 72.9 |

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|---|---|---|---|---|---|---|
| **CLINICIAN** | | | | | | |
| **1. I had adequate time to prepare for each of my therapy sessions during this term** | **1*^** | 18 | 0 | 38.9 | 33.3 | 27.8 |
| | **2*^** | 18 | 27.8 | 55.6 | 16.7 | 0 |
| **2. The frequency of therapy sessions was appropriate to plan and progress my treatments** | **1*^** | 18 | 0 | 0 | 61.1 | 38.9 |
| | **2*^** | 18 | 27.8 | 33.3 | 38.9 | 0 |
| **3. I was able to provide parents/guardians/carers with strategies to interact/play/support the child for the period until their next visit** | **1*** | 18 | 0 | 0 | 50.0 | 50.0 |
| | **2*** | 18 | 0 | 0 | 83.3 | 16.7 |
| **4. It is my impression that parents/carers had enough time in between therapy sessions to implement my suggestions** | **1*^** | 18 | 0 | 0 | 61.1 | 38.9 |
| | **2*^** | 18 | 47.1 | 29.4 | 23.5 | 0 |
| **5. I was able to develop a good relationship with the children I was treating this term** | **1** | 17 | 0 | 0 | 41.1 | 52.9 |
| | **2** | 17 | 0 | 5.9 | 58.8 | 35.3 |
| **6. I was able to develop a good relationship with the parents/guardian/carers of the children I was treating this term** | **1** | 18 | 0 | 0 | 38.9 | 61.1 |
| | **2** | 18 | 0 | 5.6 | 61.1 | 33.3 |
| **7. I believe parents/guardians/carers felt comfortable to ask me questions about the therapy I was providing to the child in their care** | **1** | 18 | 0 | 0 | 50.0 | 50.0 |
| | **2** | 18 | 0 | 0 | 66.7 | 33.3 |
| **8. I felt my overall workload was appropriate during this term** | **1** | 18 | 11.1 | 33.3 | 44.4 | 11.1 |
| | **2** | 18 | 33.3 | 38.9 | 27.8 | 0 |
| **9. I was able to adequately manage my overall workload this term** | **1^** | 18 | 11.1 | 27.8 | 50.0 | 11.1 |
| | **2^** | 18 | 33.3 | 44.4 | 22.2 | 0 |

* significant difference in the distributions of the full 4-point Likert scale between Periods 1 and 2 ($p<0.05$)

^ significant difference in the distributions of binary Strongly Disagree or Disagree/Agree or Strongly Agree between Periods 1 and 2 ($p<0.05$)

Carer perceptions varied in terms of whether they prefer either option. Some carers indicated that they did not have a preference and that both options were equally acceptable for them. Other carers explicitly articulated a preference for one model. Carers who attended weekly and those who attended fortnightly both perceived progress with their children. Some carers who attended fortnightly said the progress was however slower. Positive and negative aspects of each model are presented in Table 4.

A variety of individual child and family factors, impacting on a preferred attendance model, were described. Carers suggested weekly appointments were preferable for children who function well with routine, have shorter term goals and homework, and for better rapport building between child and therapist. Re-occurring feedback from carers suggested that weekly intervention over 10-weeks (compared to the current model of 5 sessions) would be the best option. Both groups expressed general practical difficulties in attending sessions, which were not related to fortnightly or weekly visits. Practical issues reported included transport difficulties; costs involved; arrangements for other family members; school pick-up time; nap time of child; illness and carer work commitments. For example, parents wrote:

> *"One of the sessions I was asked to work on that day with one week's notice, so had to cancel that session. We were able to reschedule it later in the week which was great, though it meant we only had a couple of days before the next session, so [it was] hard to integrate/practice the exercises" [ID 84]*

> *"[difficulty was] getting my other children to school (had to get someone else to take them)" [ID 5].*

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**Table 4 Carer and clinician perceptions of the positive and negative aspects of the fortnightly and weekly models**

| **CARER RESPONSES** | |
|---|---|
| **Fortnightly attendance:** | |
| **Positives:** | **Negatives:** |
| **Family aspects:**<br>• Easy to remember appointment<br>• More time to incorporate homework into family routine<br>• More time to reflect on what is working/ what is not working<br>• Good for routine<br>• Could schedule other family commitments into alternative week<br>• Can be more flexible when you need to re-schedule an appointment<br>• Reduced loss of child-care time<br>**Child specific aspects:**<br>• More time to practice homework<br>• Child were engaged, did not become bored, saw it as a “treat” and a “playdate”<br>• 10 weeks is a longer period to make an impact, feel supported for longer; unpack aspects of child development<br>• Gives child a break to do other things<br>• Child dislikes doing something too much | **Family aspects:**<br>• Hard to remember appointment<br>**Child specific aspects:**<br>• Child needs preparation for sessions and weekly routine would have been better<br>• Missing a session meant waiting for 4 weeks for next appointment<br>• Hard for child to remember fortnightly meetings, child felt frustrated since he was forgetful<br>• Child never got used to sessions<br>• Child needed time to become familiar with therapist each time: first half of session was spent on child becoming familiar with therapist again |
| **Weekly attendance:** | |
| **Positives:** | **Negatives:** |
| **Family aspects:**<br>• Easier to stay focused on goals<br>• Easier to build into family routine (sessions and homework)<br>• Able to ask questions weekly rather than wait too long<br>• Earlier to make changes if something doesn’t work rather than wait too long<br>• Easier to give feedback to therapist<br>• Easier to remember advice given<br>**Child aspects:**<br>• Consistency is good for child<br>• Child can remember the routine of the weekly sessions, also easier to do homework when child remembers<br>• Child engages better<br>• Child knows what to expect is coming up<br>• Child enthusiastic and keen<br>• Child settles quicker<br>• When it is hard to implement the homework at home, weekly helps with regular and consistent therapist input<br>• Child get familiar with the therapist quicker | **Family aspects:**<br>• Hard to reschedule appointments<br>• Not enough time to implement strategies at home in family routine<br>**Child aspects:**<br>• 5 weeks too short – need support for longer |
| **CLINICIAN RESPONSES** | |
| **Fortnightly sessions:** | |
| **Positive:** | **Negatives:** |
| **Family aspects:**<br>• Enough time to recover from illness and make arrangements for sessions | **Family aspects:**<br>• Had clients who forgot to attend |

| | |
|---|---|
| • Can re-book easily<br>• Good attendance<br>• Parents felt supported over longer period of time<br>• Good engagement<br>• Supports relationship-building with family over longer period<br>**Child aspects:**<br>• Allowed consolidation and generalisation of strategies at home<br>• Good engagement<br>**Clinician aspects:**<br>• Longer term changes more visible<br>• Good amount of time to prepare for sessions, organise sessions resources | • When they miss a session, it is a month before they have another session<br>• Public holidays affected frequency of intervention<br>• Takes longer to build rapport, especially with new clients. |
| **Weekly sessions:** | |
| **Positives:** | **Negatives:** |
| **Family aspects:**<br>• Minimal cancellations, good attendance<br>• Those with specific, targeted goals – keen to see progress from week to week<br>• Can remember strategies and discussions better<br>• Good rapport building<br>• Easier to remember appointment time<br>**Child aspects:**<br>• Closer rapport<br>• Good engagement<br>• Better progress: more confidence and comfort<br>• More progress with more severe Autism Spectrum Disorder<br>**Clinician aspects:**<br>• Prefers weekly: “I like weekly sessions”<br>• No impact on workload | **Family aspects:**<br>• Increased parental pressure to practice at home<br>• More unwell parents and children attending due to not being able to organise make-up sessions, causing more staff being unwell too<br>• Parents took “less responsibility” for homework, relied on therapy sessions<br>• Less parent engagement<br>• Less flexibility for parents – hard to do make-up sessions<br>• More cancellations<br>• Parents appeared flustered and fatigued<br>• Difficulty completing homework<br>• Clients not supported over longer period; less contact with family over a school term<br>• Inhibited family-centred approach<br>**Child aspects:**<br>• Sometimes can add pressure to show progress<br>• Intensity did not allow clients to recover well from illness<br>• Younger children fatigued<br>• Does not suit all diagnoses<br>• Less progress<br>**Clinician aspects:**<br>• Less time for other duties: administration, follow up, referral to other services, reports<br>• Less time for reflection: less analysis of assessments<br>• Took longer to find direction in intervention<br>• More stress, felt burn-out; felt that they needed to devote more time and came in earlier/stayed later but never felt on-top of workload |

Clinicians provided varied responses. Many saw no impact on therapeutic outcomes, client engagement or attendance with either intervention models while others had strong preferences for a specific model. Many commented that it depended on the child and family. Comments were made that it would be best to have the carer choose what model works best for them. It was recommended that the service employs a flexible model where families can have the benefit of the most appropriately timed service for them. One clinician reported that overall 10 weekly sessions would be best, as whilst it is the same amount of sessions, the longer period allowed for by the fortnightly sessions, enabled more contact over a longer period of time with families. Some therapists articulated workload stress related to the weekly sessions, while others did not see any impact on their workload. Positive and negative aspects mentioned by the clinicians, are summarised in Table 4.

Concerns were raised by therapists regarding 5-weeks of contact with the service (weekly) compared to 10 (for the fortnightly), meaning a longer non-contact period with potentially vulnerable families. Clinician themes included: mixed perceptions of increased workload with the weekly model (as they adjusted to this new model), and more time needed to see change for some children who require more intensive input (see Table 4).

The common themes related to time needed for some children to build rapport with the therapist; weekly is better for some families in remembering to attend and best frequency model depending on individual child goals, condition and intensity of the intervention involved. By way of example:

> *"…both weekly and fortnightly sessions have merit both for the family and children but also clinicians…we need to keep in mind the fact that we are not 'doing therapy to', but 'engaging in therapy with'. Therapeutic intervention is a collaborative process between clinician and client (family); not all change will or can occur in one hour of contact. Success is bound to be better with parent follow-through and coaching models, along with skills development both with the client and family is vital and is keeping with evidence-based practice." [ID 116].*

## Discussion

The aim of this study was to review the impact of the frequency of therapy intervention on carers, child outcomes and clinician workload for children aged 1-4 years with developmental delay accessing allied health community therapy. The dosage of therapy was maintained at 5-sessions, and a fortnightly model over 10-weeks was compared to a weekly model over 5-weeks. The results showed no statistically significant change in overall attendance rates between the fortnightly model versus weekly model. These results suggest that attendance rates / same day cancellations were impacted by general issues such as illness and other commitments rather than the frequency of the sessions. Qualitative themes from the clinician perspective did suggest that there was a higher incidence of children attending sessions unwell with the weekly model compared to fortnightly model and less time for children and clinicians to recover from illness between weekly appointments.

The results showed no statistically significant difference in overall change scores for performance or satisfaction on the COPM in the fortnightly versus weekly models. A variety of conditions/diagnoses are seen within the allied health paediatric community setting that present a variety of developmental areas that require intervention. Different professions are involved, who will target different issues and use different therapy techniques based on the areas of delay. The impact of the frequency model on the outcome was therefore considered from the perspective of profession involvement and type of problem identified by the carer. From the COPM results there was no correlation between profession involvement or type of problem identified by carer and the overall change scores in the COPM for either frequency model; suggesting that profession involvement or problem identification alone are not indicators for a preferred frequency model in regards to therapy interventions.

When considering the qualitative responses from carers in the questionnaire, similar themes presented for both the positive and negative aspects of each of the frequency models. Some carers found the weekly model more efficient for building rapport and child engagement, especially when routine was fundamental to the child; however other carers found fortnightly appointments facilitated better engagement with the therapist and the session activities. Some carers found the model with weekly visits increased their engagement in home activities as they were less likely to forget and were kept more accountable and others found it was too much pressure and not enough time to see change. Quantitative data from the questionnaires show that carers agreed that they were able to remember times of the sessions more in the weekly model.

From a clinician perspective, the questionnaire responses regarding therapy components such as the ability to provide homework between sessions and carer ability to complete the homework, showed a preference for the fortnightly model. When comparing the item regarding carer ability to complete homework/integrate strategies into home routine between the clinician and the carer's responses, this change was not mutually perceived. In fact, whilst not statistically significant, the carer data shows a slight trend towards a positive response (i.e. more strongly agree and agree) with weekly therapy compared to fortnightly therapy, unlike the clinician perception moving from 100% positive response with fortnightly sessions to 76% negative response (i.e. combined disagree and strongly disagree) for the weekly sessions. The reason for this is unknown and will require further exploration. Qualitatively the clinician perceptions regarding therapy provision was similar to that of the carer responses in regards to rapport building, engagement and progress being both negatively and positively impacted by the different frequencies depending on the individuals involved.

From a clinician workload perspective, the results suggested a perceived increased workload and time pressures with a weekly model compared to a fortnightly model. Whilst theoretically the workload should not change with a change of frequency when the occasions of service (i.e. number of therapy sessions provided and number of children receiving therapy) do not change, further review of this perception of the impact on workload may need to be considered. From the qualitative clinician data, less time for other duties such as administration, follow up, referral to other services and report writing were listed as issues with the weekly model causing clinicians to feel more stress. Some reported feeling a need to devote more time and came in earlier and/or stayed later whilst never feeling on-top of the workload. Some reasons for this have been hypothesised, including the reliance on outside services providing timely information or responses, development of resources needing to be actioned sooner. Potential issues in service design were identified with some clinicians reporting they had less cancelations/non-attendances with weekly sessions meaning less opportunities to catch up on other work (however the ideal service model is to reduce cancellations and non-attendance rates) and clinicians needing time to adapt to the different service model. This is an area that may benefit from further service design review rather than be an issue related specifically to the frequency of therapy model.

Another theme identified in the qualitative data from both clinicians and carers was the overall contact time with the service. Whilst some carers and clinicians felt the benefit of weekly therapy in providing increase consistency, routine and intensity, a limitation of this model was the shortened period of contact (5 weeks rather than 10 weeks) with the service. Relating this to the potential vulnerability of some families accessing this service was a significant concern for many clinicians. This theme was commonly linked both from carers and clinicians with the proposal that a higher dosage of therapy would also be more beneficial. Carers who had experienced both frequency models, often reported the overall preference of model came down to a choice between increased frequency or increased contact time with the therapist/service and what the priority was for the child and situation. It was stated on a number of occasions that the preference, if it was available, would be a weekly therapy model over 10 weeks (i.e. increase frequency and increase in dosage of therapy).

The community allied health service set out to address current challenges with service frequency and from a service planning perspective, when considering all the above impacts of the weekly versus fortnightly frequency model, it appears there is no ‘one size fits all’ frequency model when looking at blocks of therapy for children aged 0-4 years with developmental delay receiving early intervention allied health services. Instead, a flexible model that allows consideration of the type of involvement, condition/diagnosis, therapy interventions and clinician clinical reasoning along with relationship development with the child and family, family practicalities, vulnerability of the family and benefits for contact time with service is desirable. An individualised, tailored model with a combination of service delivery options is recommended as best practice in early intervention (Shonkoff and Phillips, 2010). In addition, the results of this service review are a pertinent reminder of taking a contextual, ecological view of the child and condition, supported by the classical Bronfenbrenner theory (1979), which is still very relevant today due to the increased recognition of the complexities influencing children’s development. Renowned early intervention authors such as Harbin, McWilliams and Gallagher (2000) and occupational therapy researchers Kingsley and Mailoux (2013) support this outcome of the current research by recommending that service providers are flexible, adaptive and use a mix of service delivery models.

## Limitations and recommendations for further research

Whilst the COPM results did not demonstrate a statistically significant change, it should be noted that this is a self-administered tool, based on carer perceptions of priority performance areas of the child, and the scope of this study does not include standardised therapy outcomes or clinician based assessments on improvement, specific to each of the professions involved or the therapy interventions being used.  There was a common theme in the clinician perceptions that less change/improvement was noticed in the children receiving weekly therapy compared to those receiving fortnightly therapy which may have been demonstrated using a different outcome measure for the research study. Due to the variability of the outcomes/change being assessed by clinicians in this study (outside of the COPM tool), this was not in the scope of the current project. Benefit may be found in future research reviewing the impact of frequency and dosage of therapy for specific professions/interventions and or specific developmental areas of delay.

Another limitation of this study was its ability to identify the practical aspects of workload impact compared to the theoretical or perceived workload impact for clinicians. As previously mentioned, there was no increase in occasion of services for clients (i.e. dosage remained the same and total number of children receiving therapy over the intervention periods remained unchanged, non-attendance rates did not change significantly therefore the number of therapy sessions provided was unchanged), which would suggest that adjustment to the new model would be the contributing factor to a perception of increased workload. The design of the study and the questionnaires used however may have limited the access to data pertaining to practical aspects of workload impact and as the results showed a statistically significant change in regards to frequency, this may warrant further investigation and research. Despite these limitations the prospective multi-informant, group comparison design of both outcomes and perspectives, provides an increased understanding of the capacity for a weekly therapy model that had not been trialled before in this service and a base to consider enablers and barriers for a future service model design.

## Conclusion

A flexible model of service frequency is recommended, to suit the needs of each child and their carer, aligning with clinician clinical reasoning. Decision making considerations should include: condition, type of therapy (i.e. need for intensity/longer period/routine/relationship building), family practicalities, family vulnerability and benefits of service contact time.

**Key messages:**

- The appropriate frequency of early intervention sessions were investigated, comparing fortnightly versus weekly model for visits for outpatient, clinic-based, Allied Health Early Intervention service
- No statistically significant difference occurred between both models for overall attendance rates or outcome measures through the Canadian Occupational Performance Measure.
- Carers and clinicians provided a variety of preferences, indicating the impact of individual child, family and clinician factors.
- A flexible model of service frequency is recommended, with consideration given to individual child and family factors, and which aligns with clinician clinical reasoning related to aspects such as the condition, type of therapy (i.e. need for intensity/ longer period/routine/relationship building), family practicalities, family vulnerability and benefits of service contact time.

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