

Background & Purpose

Studies examining pediatric physical therapy (PT) outcomes lack description of treatment plans & intervention methods. This hinders exploration of relationships between client characteristics, treatment provided & therapy outcomes & limits applicability of research evidence to practice.

In addition, pediatric PTs do not have a standard system to document therapy activities & intervention methods that therapists, clinical facilities & researchers can share.

A part of the Move and PLAY¹ study, the Physical therapy Interventions in Pediatrics (PTIP)² system has been designed to describe PT activities and interventions used with children with Cerebral Palsy & explore their associations with functional outcomes. A similar documentation system has been used in patients with stroke^{3,4}.

The aim of this study was to explore the utility of a modified PTIP system at an outpatient pediatric clinic to understand association between client goals, PT activities and interventions and client outcomes.

Design & participants

Design: Case study to examine utility of PTIP during 3 phases of intervention delivered over 26 weeks

Child: 5 year old girl with Cerebral Palsy. GMFCS level III ambulating with posterior rolling walker.

Intervention:

PT program	Foci of Therapy
Phase 1 2x/wk for 3 wks, 60 min session (total: 360 min) PTIP recorded 1x week	BTX to bilateral hip add, hamstrings at the beginning • A/P ROM of hip & knee joints for dissociation of LEs • Trunk & LE strengthening for transitions & standing goals
Phase 2 1x/wk for 13 wks, 60 min session (total: 780 min) PTIP recorded 1x mo	Maintain skills acquired in Phase 1
Phase 3 3x/wk for 6 wks, 75 min session (total: 1350 min) PTIP recorded 1x week	ADELI suit provides improved postural alignment & joint compression with use of resistive bungees. • LE strengthening for isolated LE control • Standing postural control with emphasis on bringing COM backward in line with BOS (decrease crouch).

Therapist: Pediatric PT with 8 years of experience.

Materials & Outcome measures

Data collection form: (Fig 1). Data collection form adapted from original PTIP materials for use at Pathways Center.

Modified PTIP activities and intervention codes: (Fig 2). Activities & codes to document PT intervention adapted from original PTIP form. Codes modified & expanded to make applicable to wider variety of clients. The child's treating therapist collected data.

Goal Attainment Scale (GAS)⁵: The treating therapist designed individualized goals for phases of intervention (Table 1).

Gross Motor Function Measure (GMFM)⁶: 5 dimensions were used to document change in functional motor performance over 3 phases of intervention (Fig. 7)

Fig 1. Note sections for monitoring activities associated with individual goals, section for subjective information, parent report and therapist's comments and observations. Wheelchair related interventions included in Activities as Wheelchair Mobility. Health, wellness & fitness and Community integration added to Activities.

Type of activity	Intervention method
A. Pre-Functional	24. Furniture
B. Floor Mobility	25. Dressing & self-care
C. Wheelchair mobility	26. Sports & recreation
D. Transitions & Transfers	27. Family routines
E. Sitting	28. Other
F. Standing	Cognitive training
G. Gait activities	29. Cognitive/verbal planning
H. Self Care	30. Mental imagery/practice
I. Developmental Play	Strengthening
J. Sports training	31. Functional Strengthening
K. Recreation & Leisure	32. Resisted exercise
L. Health, wellness & fitness	33. Muscular endurance training
M. Community Integration	34. Plyometric/Power training
N. Other activity	35. Eccentric training
	Cardiopulmonary Interventions
	36. Breathing activities
	37. Aerobic exercise
	Balance & postural control
	38. Anticipation
	39. Reactive responses
	40. Altered BOS
	41. Weight Shifts
	42. Gait training
	43. Partial BWS
	44. Gait pattern modification
	45. Star activities
	46. Advanced gait training
	Facilitation
	47. Physical guidance
	Motor performance
	48. Inter-limb coordination
	49. Intra-limb Coordination
	50. Timing and sequencing
	51. Visual-motor coordination
	Sensory-motor aspects
	52. Deep pressure
	53. Tactile
	54. Vestibular
	55. Proprioceptive
	56. Auditory/Sound/Verbal
	57. Visual cues/feedback
	Upper Extremity Function
	58. Forced Use

Fig 2. Activities and codes to document PT intervention. Additions to codes: Modalities, Adaptations, Strengthening, Motor performance, UE function, Sensory-motor aspects. NDT broken down into Facilitation & Handling. Fewer codes for Assistive devices, none for Positioning devices, Animal Interventions.

Goal Area	Goal	Baseline performance
Phase 1 PT 2x/week	Transition Half kneel to stand When asked to pull to stand via half kneel leading with the LLE (barefoot), S. will weight bear on a flat foot 1/4 trials. NOT ACHIEVED	S. primarily uses UEs to pull to stand. When leading with the LLE (barefoot) she transitions to stand thru half kneel on her toes followed by BLE extension.
	Transition Sit to Stand S. will transition from bench sitting to stand using BUE to push off from the seat and reach for a toy while wearing shoes and orthotics, without losing her balance 3/5 trials. ACHIEVED	Transitions to stand after 2-3 trials, and loses her balance when standing to reach for a toy.
	Standing Upright standing Once placed in standing with proper alignment while wearing shoes and orthotics, S. will sustain standing 1-2 sec without support. 1/4 trials. ACHIEVED	S. immediately loses her balance posteriorly once manual support is removed.
Phase 3 PT 3x/week	Transition Sit to Stand S. will transition from bench sit to stand using BUE to push off and reach for a toy while wearing shoes and orthotics and sustain 5 sec of standing, and lower self to sitting without LOB consistently, after 1-3 practice trials. ACHIEVED	S. requires 3-4 attempts to transition from bench sit to stand. The back of her LEs rest against the bench for support.
	Standing Upright standing Once placed in standing with proper alignment while wearing shoes and orthotics, S. will sustain standing 2 to 3 seconds without support. 3/4 trials. ACHIEVED	S. immediately loses her balance posteriorly once manual support is removed.
	Standing Standing postural control S. will sustain standing while holding a trapeze bar placed at shoulder height, and move it forward and backward without losing balance 5/5 times. ACHIEVED	S. stands with heavy reliance on UEs for support. S. can move trapeze bar forward, but loses her balance when moving it back.

Table 1. GAS goals for Phases 1 and 3. In Phase 2, S's treatment continued to focus on goals from Phase 1. GAS were designed to reflect small, incremental changes in S's mobility and skills which would progressively cumulate in changes in functional performance. Greater focus was placed on transitions in Phases 1 and 2 and on standing activities in Phase 3. See Figs. below for relationship to intervention.

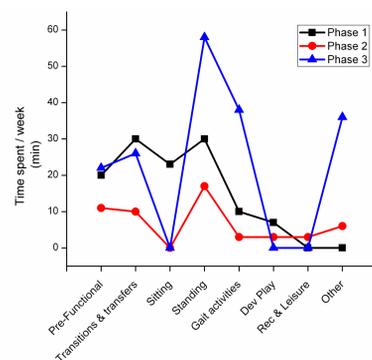


Fig 3. In Phases 1 & 2, more time spent on Pre-functional activities compared to Standing & gait activities which occupied majority of weekly therapy minutes in Phase 3. No time spent in Sitting in phase 2 & 3. Other: Formal and informal assessment & donning and doffing ADELI suit.

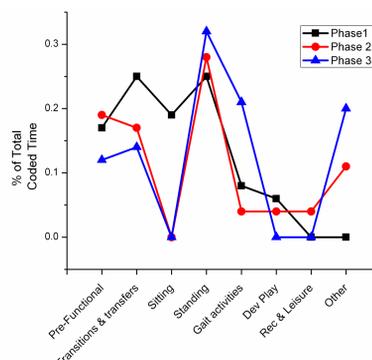


Fig 4. Illustrates differences between proportion of total therapy time allocated to activities. Phase 1- greater dispersion over a variety of activities. Phase 1 & 2 Pre-functional and Transition activities emphasized. Phases 2 and 3 emphasis shifted to Standing and Gait activities.

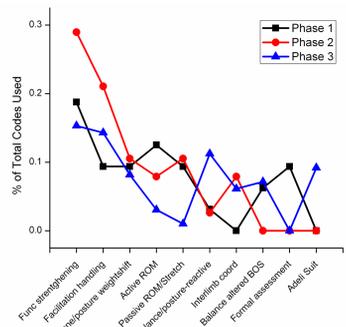


Fig 5. Phases 1 & 2- fewer interventions implemented, ROM & Strengthening emphasized. Phase 3- wider variety of interventions employed with greater emphasis on balance & postural control where PT frequency was higher.

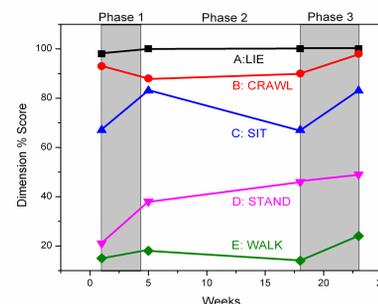


Fig 7. Changes in total percentage scores for Dimensions A (Lying & Rolling), B (Crawling & Kneeling), C (Sitting), D (Standing) and E (Walking, Running & Jumping) of the GMFM over Phases I, II and III.

Discussion

The modified PTIP system illustrated differences between emphases, intervention content, time utilization by 1 therapist for 3 phases of PT of different intensity for a child with CP & was successful in explaining their associations with foci of treatment, client goals & functional outcomes.

The treating therapist reported that the system-
1) Objectively & accurately reflects the treatment she provided

2) Highlights differences in treatment provided over the 3 phases.

3) Highlights importance of therapy intensity & congruence of treatment activities with goal areas and outcomes

4) Is useful for planning time allocation & intervention selection to achieve goals

5) Can potentially educate therapists & parents on importance of intensity, goal-focused treatment & outcome measurement.

Future Directions

1) Develop systematic method to capture and convey therapists' clinical problem-solving process to elucidate stronger associations between clinical decisions, therapy content and outcomes.

2) For development of larger studies examining cause- and-effect relationships between PT intervention and outcomes.

3) Aid in teaching students & novice therapists clinical decision-making skills for specific ages & diagnoses.

4) Merge modified PTIP system with PT documentation & billing system to increase efficiency. Create electronic data entry to reduce paperwork, make data extraction, analysis and reporting easier.

Use of the modified PTIP system may facilitate development of research studies where research questions and findings have greater relevance to the complex environments in which physical therapists practice.

References

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Acknowledgments

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