ACADEMY OF PEDIATRIC PHYSICAL THERAPY

Intensity of Service in an Outpatient Setting for Children With Chronic Conditions

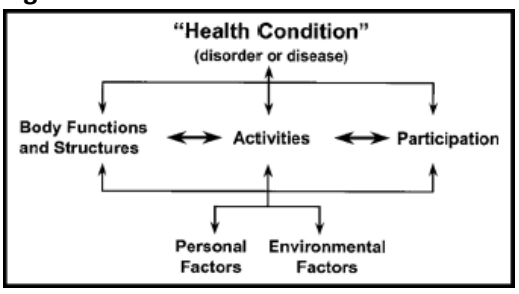
Introduction

The purpose of this document is to provide recommendations for decision-making to physical therapists in the outpatient setting regarding intensity of care for children with lifetime health conditions. Currently, there is no succinct guide for decision-making regarding intensity of service delivery or discontinuation of physical therapy for children with lifetime health conditions. The lack of consistent, evidence-based recommendations leads to a plethora of decision making paradigms that vary within and among health care providers and families. This presents a clinical decision-making problem for the pediatric physical therapist: How often should physical therapy sessions occur and how long should the sessions last?[1] Ethical dilemmas may occur, especially when those involved disagree.[2] Since children with lifetime health conditions have ongoing needs, the pediatric physical therapist will have to make ethical, evidence-based decisions about intensity of service to meet the needs of the child and family.

For the purposes of this document lifetime health conditions refer to developmental disabilities across the lifespan, progressive disorders occurring in childhood, and other chronic conditions beginning in childhood.[3]

This document uses the International Classification of Functioning, Disability, and Health (ICF) model[4] (Figure) and the Guide to Physical Therapist Practice[5] as a framework for decision-making. These recommendations are based on current literature for intensity of care and motor-learning principles.

Figure. International Classification of Functioning, Disability, and Health



The operational definitions for intensity for these recommendations are the framework defined by Bailes and colleagues.[1]

(1) **Episode of Care**:
How long or what is the duration from first service session to last service session?

(2) Frequency of PT Services
How often is a child seen?

- **Intensive**: 3–11 x per week
- **Weekly/bimonthly**: 1–2 x per week to every other week
- **Periodic**: Regularly scheduled intervals
- **Consultative/monitoring as needed**: Parent or PT initiated depending on setting

(3) **Length of visit**:
How long (amount of minutes) does a service or intervention session last?

Guiding Ethical Principles

It is important for physical therapists to adhere to the following ethical principles3:

- **Distributive justice**: fairness and equality of health resources considering patient need and ability to benefit from service;
- **Beneficence**: doing good;
- **Duty**: referring to our responsibility to the patient, the referring physician, our profession, and society.

The professional responsibility of the clinician is to determine the appropriate allocation of outpatient physical therapy services that best serve the child and family. According to APTA's Standards of Practice,[6] continuing to see a patient who no longer benefits from therapy violates these standards.

Motor Learning Principles

Motor learning can be defined as ". . . a set of processes associated with practice or experience leading to relatively permanent changes in the capability for movement."[7p302] There are several motor-learning principles that impact children's capacity to learn new motor tasks. These include the following: sensitive periods and readiness for children to learn new skills,[8] stages of learning,[9] high quantities of practice (intense practice) with appropriate feedback,[10,11] and creating the opportunity for children to practice activities that are meaningful and goal-directed in diverse environments.[10,12,13] The pediatric physical therapist needs to consider these principles when determining the intensity of physical therapy services.

There is emerging research that suggests that there are "sensitive periods" in development for skill acquisition that are experience-dependent, such as standing balance and walking in the infant.[8] This preliminary research suggests that the timing and intensity of physical therapy intervention may impact outcomes.[8] By recognizing when the child is ready to learn a new skill, the PT may then determine if there is a need for increased intensity of physical therapy services.

During the beginning stage of learning, the cognitive stage, the focus of practice for the child is to gain a general idea of the movement strategy. Performance will be variable, with a large number of errors. A greater amount of guidance and feedback from the PT is optimal. During the second stage of learning, the associative stage, high quantities of practice are required for the child to refine the movement

pattern. Performance becomes more consistent over time, with a gradual weaning of feedback from the PT. During the third stage of learning, the autonomous stage, the focus is on practice across different environments so that automaticity of performance can occur. Practice in different environments affords the child a greater variety of meaningful learning opportunities to create motor memory and establish a learned task.

Evidence on Intensity

Episode of Care

Authors have described and studied service delivery variations for specific populations of children. In a survey of physical therapists in the United States on service delivery for children with cerebral palsy, the authors reported ongoing services for younger children and more episodic care for school-aged children and youth.[14] In a survey of physical therapists in Canada, the most frequently indicated duration of an episode for children with cerebral palsy (CP) was a year or less (Saleh 2008). Others conclude that one size does not fit all children or families' needs.[16,17] A recent opinion article examined intervention approaches in children with developmental disabilities and recommended breaks in therapy to allow practice in the community setting for skill generalization, thus supporting episodic care.[17]

There is no evidence in the literature to support a definite length of an episode of care. In a recent systematic review of physical therapy interventions for children with CP, the length of an episode of care varied.[18] Length of episode of care for strengthening programs for children with CP ranged from a minimum of 5 to 40 weeks; functional training programs, 6 to 8 weeks; treadmill training, 2 to 12 weeks; and neurodevelopmental treatment, 6 to 16 weeks. Current evidence for intensive episodes of care for strengthening and endurance training for children with neuromuscular disorders such as cerebral palsy and Down syndrome have been well documented.[19-22] This specific body of literature highlights the connection between length of episode of care and frequency of intervention.

Frequency

The current evidence for frequency of physical therapy service can be characterized by patient population and types of intervention. When evaluating this literature, it is important for PTs to consider the feasibility of intensity of service, types of outcome measures, and the inclusion of longitudinal follow-up. In a Canadian survey study of rehabilitation service utilization for children with developmental delays, parents reported that interventions were typically provided weekly or biweekly.[16] Other studies of children with CP have evaluated a greater or more intensive frequency of physical therapy, 4 to 5 times per week, with varying episodes of care ranging from 2 weeks to 6 months.[23-28] These studies have compared the intensive delivery to "routine, usual, or traditional" amounts ranging from biweekly to 2 times a month. Types of intervention included in these studies have varied and have not been thoroughly described but can be characterized as eclectic approaches influenced by neurodevelopmental treatment and motor-learning principles.

Researchers of intensive frequency have suggested that intensive periods of therapy are well-tolerated,[27] may lead to better adherence and fewer cancellation visits compared to continuous delivery of services,26 and some parents prefer the intensive treatment alternative.[25] It is important for PTs to consider that families who agreed to participate in studies of greater intensity may not be representative of all families. It is likely that some families prefer an intermittent intensive schedule while others do not. More research is needed to determine feasibility and preferences for service delivery.

The Gross Motor Function Measure (GMFM) has been used as a standard outcome measure for children with cerebral palsy. The findings for changes in gross motor function when comparing varying levels of frequency of service have been inconsistent. Results vary from increased GMFM scores,[26] trends towards differences in GMFM scores,[22,23] inclusive results in GMFM scores,[24] and no differences in GMFM scores between intensity dosages.[25]

In studies that included a follow-up period post intervention, Bower reported that the advantage of intensive service declined over the subsequent 6 months during which therapy had reverted to its usual amount,[23] while Trahan[27] demonstrated that gains were maintained during breaks from physical therapy. More research is needed to determine if effects of physical therapy are maintained and under what conditions.

Other researchers examining the effect of intensive service delivery have studied functional and task-specific interventions, such as constraint-induced movement therapy (CIMT)[29] and body-weight–supported treadmill training (BWSTT).[21] While CIMT has been studied primarily in children with CP, research on BWSTT has included children with varying conditions such as Down syndrome, CP, spinal cord injury, and other neurological conditions. For CIMT[29] and BWSTT,[21] frequency of physical therapy is usually intensive but ranges from weekly to daily. A recent systematic review of CIMT reported positive effects for a variety of outcomes; however, threshold for intensity is not known.[29] Efficacy for accelerating walking development in children with Down syndrome using BWSTT has been demonstrated.[30,31] Improved motor skills and increased walking speed have been reported in children with cerebral palsy, spinal cord injuries, and other central nervous system disorders. However, more rigorous studies are needed to strengthen the evidence.[21]

Length of Visit

Currently, there is no evidence in the literature as to the ideal length of each physical therapy session. One survey study asked PTs how they made decisions for the length of a physical therapy visit and found that decisions were based on the PTs' experience, practice setting, and reimbursement issues.[30] In Canada, Saleh[32] reported that the most frequent length of a physical therapy visit for children with cerebral palsy was 45-60 minutes.

Based on the current research, the optimal intensity of physical therapy service is not known. It is challenging to synthesize the research because of variability in intensity protocols, type of intervention, and patient population. More likely than not, there is not one ideal length of episode of care, frequency of physical therapy service, or length of visit.

Recommendations to Help Determine Intensity

Clinical decisions for intensity of physical therapy services should be made collaboratively with the family to meet their unique needs. According to Montgomery,[33] factors to consider for intensity include: cognitive ability, motivational level, physical environment, care-giver availability, diagnosis, prognosis, child's age, and functional goals. More recently, Palisano and Murr[34] expanded these factors and recommended that since physical therapy service occurs in different settings, PTs need to engage in ongoing coordination, communication, and documentation of care between outpatient, home, school, and community. In order to ensure generalization of skills, different intensities of service delivery in more than one physical therapy setting may occur simultaneously.[35] For example, in a given period, a

child may have physical therapy once a week in the school setting but only once a month in the outpatient setting. Due to the many factors that determine intensity of care, it is expected that physical therapy intensity will change over time, and frequency and length of visit also may change within an episode of care. It is recommended that PTs be familiar with different practice environments and advocate and assist families in coordination of care across different practice settings.[35]

Based on the ICF, it is recommended the PTs consider the following when determining intensity of physical therapy service:

- **How do you determine the child's activity and participation goals?**
  - **Identify child and family priorities**
    - For example, a 17-year-old adolescent with juvenile rheumatoid arthritis wants to be able to walk across the stage for his high school graduation instead of using his wheelchair. He sought out physical therapy services to work towards this goal. In collaboration with the family, the physical therapist may consider an intensive frequency of physical therapy for a short episode of care to accomplish his goal.
- **How do you determine the expected course of the child's health condition, and how does this impact the child's activity and participation goals?**
  - **Determine the child's current health condition and anticipated future needs**
  - **Evaluate the impact of the health condition on the child's activity and participation**
    - For example, as a child with spastic diplegia grows, he or she may require medical/surgical intervention, such as botox or tendon releases. In order to maximize intervention effects, intensive physical therapy for strengthening and maintenance of muscle length may be required and may best be provided in the outpatient setting.
- **How do you determine the impact of body structure and function on the child's activity and participation goals?**
  - **Examine and identify body structure and function factors**
  - **Hypothesize which factors impact child's activity and participation**
    - Strength/Range of Motion/Balance/Spasticity
      - For example, a high school student with spastic diplegia wants to run on the track team in school. He comes to the outpatient PT to improve his running performance. After an initial examination, evaluation, and consideration of the literature, the PT determines a sports-specific strengthening exercise program that includes warm-up and cool-down. Intensive exercise and practice is required but may best occur in the weight room with the team trainer and his teammates. The outpatient PT provides initial consultation with the trainer and may continue physical therapy at a periodic or monitoring level.
    - Development and readiness to learn: Is the child at the point of acquisition of a new motor skill?
      - For example, a 2-year-old child with developmental delay demonstrates readiness to walk. Currently, she is able to stand independently for 2 seconds and then performs a sit-to-stand from a bench. The PT recommends to the family that this may be an appropriate time for intensive physical therapy services and discusses the feasibility of frequent visits (3-5 times per week). Once the child demonstrates the walking skill, a practice schedule is established in different natural environments (home, child care, and other

community settings). At that time, outpatient physical therapy can decrease to consultative/monitoring and coordination with early intervention services.

- **How do you identify the contextual factors impact the child's activity and participation goals?**
  - **Identify and evaluate the child's personal factors**
    - Motivation to learn
    - Cognition
    - Emotional health
      - For example, an 8-month-old infant with a diagnosis of torticollis is referred to outpatient physical therapy for management of musculoskeletal issues. The infant has a close attachment to her mother and is beginning to demonstrate appropriate stranger anxiety. The PT recognizes the need for intense intervention and discusses options with the mother, who is receptive to implementing a home exercise program, environ-mental adaptations, and play recommendations. In respect for the infant's emotional health and the motivational and cognitive affordances of the home environment, the PT recommends weekly outpatient visits to monitor and update a home program. The PT offers to provide an initial home visit.
  - **Identify and evaluate the child's environmental factors**
    - Family supports and resources
      - For example, for a 10-year-old child with muscular dystrophy, a PT recommends weekly outpatient visits for wheelchair evaluation and training. Due to work schedules and responsibilities for 3 other siblings, the family expresses concern that they will not be able to adhere to this schedule. In respect for the family's current resources, the PT offers to coordinate with the school-based therapist to establish a mobility training program that can be implemented in the school setting. Outpatient physical therapy will be scheduled periodically to manage future neuromuscular issues.
    - Physical and social environments of home, school, and community
      - For example, parents of a 5-year-old girl with spastic diplegia are interested in a body-weight–supported treadmill training program to optimize her walking. The PT recommends an intensive episode of care at the outpatient facility. The PT collaborates with the family for practice in the home and other community settings and coordinates with the school-based therapist.

References

(1) Bailes A, Reder R, Burch C. Development of guidelines for determining frequency of therapy services in a pediatric medical setting. Ped Phys Ther. 2008;20(2):194-198.

(2) Purtilo R. Whom to treat first and how much is enough? Ethical dilemmas that physical therapists confront as they compare individual patients' needs for treatment. Inter J of Tech Assess in Health Care. 1992;8:26-34.

(3) Centers for Disease Control and Prevention Web site. People with disabilities: living healthy. http://www.cdc.gov/Features/Disabilities. Accessed February 15, 2012.

(4) World Health Organization Web site. International classification of functioning, disability, and health. http://www.who.int/classifications/icf/en/. Accessed February 15, 2012.

(5) American Physical Therapy Association. Guide to Physical Therapist Practice. 2nd ed. Alexandria, VA: American Physical Therapy Association; 2001;81:9-744.

(6) American Physical Therapy Association. Standards of Practice for Physical Therapy. http://www.apta.org/uploadedFiles/APTAorg/About_Us/Policies/HOD/Practice/Standards.pdf#search=%22Standards of Practice%22. Accessed May 4, 2012.
(7) Schmidt RA, Lee TD. Motor Control and Learning: A Behavioral Emphasis. 4th ed. Champaign, IL: Human Kinetics; 2005.
(8) Campbell S, Palisano R, Orlin M. Physical Therapy for Children. St. Louis, MO: Elsevier/Saunders; 2012:52-54.
(9) Zwicker J, Harris S. A reflection on motor learning theory in pediatric occupational therapy practice. Can J Occup Ther. 2009;76(1):29-37.
(10) Damiano D. Activity, activity, activity: rethinking our physical therapy approach to cerebral palsy. Phys Ther. 2006;86:1534-1540.
(11) Sullivan KJ, Kantak S, Burtner PA. Motor Learning in children: feedback effects on skill acquisition. Phys Ther. 2008;88:720-732.
(12) Valvano J. Activity focused motor interventions for children with neurological conditions. Phys Occup Ther Pediatr. 2004;24:79-107.
(13) Mastos M, Miller K, Eliasson AC, Imms C. Goal directed training: linking theories of treatment to clinical practice for improved functional activities in daily life. Clin Rehab. 2007;21:47-55.
(14) Chiarello LA, O'Neil M, Dichter CG, et al. Exploring physical therapy clinical decision making for children with spastic diplegia: survey of pediatric practice. Pediatr Phys Ther. 2005;17(1):46-54.
(15) Hanft B, Feinberg E. Towards the development of a framework for determining the frequency and intensity of early intervention services. Infant Young Child. 1997;10(1):27-37.
(16) Majnemer A, Shevell MI et al. Early rehabilitation service utilization pat-terns in young children with developmental delays. Child Care Health Dev. 2005;28(1):29-37.
(17) Schertz M, Gordon AM. Changing the model: a call for a re-examination of intervention approaches and translational research in children with developmental disabilities. Dev Med Child Neurol.2009;51(1):6-7.
(18) Martin L Baker R, Harvey A. A systematic review of common physiotherapy interventions in school aged children with cerebral palsy. Phys Occup Ther Pediatr. 2010;30(4):294-312.
(19) Dodd K, Taylor N, Damiano D. A systematic review of the effectiveness of strength training programs for people with cerebral palsy. Arch Phys Med Rehab. 2002; 83(8):1157-64.
(20) Dodd KJ, Shields N. A systematic review of the outcomes of cardiovascular exercise programs for people with Down syndrome. Arch Phys Med Rehab. 2005;86:2051-2058.
(21) Damiano D. Rehabilitative therapies in cerebral palsy: the good, the not as good, and the possible. J Child Neurol. 2009;24(9):1200-4.
(22) Fragala-Pinkham MA, Haley S, Goodgold S. Evaluation of a community based fitness program for children with disabilities. Pediatr Phys Ther. 2006;18(2):159-167.
(23) Bower E, McLellan DL. A randomized controlled trial of different intensities of physiotherapy and different goal setting procedures in 44 children with cerebral palsy. Dev Med Child Neurol. 1996;38(3):226-37.
(24) Bower E, Michell D, Burnett M, Campbell MJ, McLellan DL. Randomized controlled trial of physiotherapy in 56 children with cerebral palsy for 18 months. Dev Med Child Neurol. 2001;43(1):4-15.
(25) Ustad T, Sorsdahl A, Ljunggren A. Effects of intensive physiotherapy in infants newly diagnosed with cerebral palsy. Pediatr Phys Ther. 2009;21:140-149.
(26) Christiansen AS, Lange C. Intermittent versus continuous physiotherapy in children with cerebral palsy. Dev Med Child Neurol. 2008;50(4):290-3.

(27) Trahan J, Malouin F. Intermittent intensive physiotherapy in children with cerebral palsy: a pilot study. Dev Med Child Neurol. 2002;44(4):233-9.
(28) Tsorlakis N, Evaggelinou C, Grouio G, Tsorbatzoudis C. Effect of intensive neurodevelopmental treatment in gross motor function of children with cerebral palsy. Dev Med Child Neurol. 2004;46(11):740-745.
(29) Huang H, Fetters L, Hale J, McBride A. Bound for success: a systematic re-view of constraint induced movement therapy in children with CP supports improved arm and hand use. Phys Ther. 2009;89:1126-1141.
(30) Ulrich DA, Lloyd MC, Tiernan CW, Looper JE, Angulo-Barroso RM. Effects of intensity of treadmill training on developmental outcomes and stepping in infants with Down syndrome: a randomized trial. Phys Ther. 2008;88(1):114-122.
(31) Ulrich DA, Ulrich BD, Angulo-Kinzler RM, Yun J. Treadmill training of infants with Down syndrome: evidence-based developmental outcomes. Pediatr. 2001;108(5):E84.
(32) Saleh MN, Korner-Bitensky N, Snider L, et al. Actual vs. best practices for young children with cerebral palsy: a survey of paediatric occupational therapists and physical therapists in Quebec Canada. Dev Neurorehab. 2008;11(1):60-80.
(33) Montgomery P. Frequency and duration of physical therapy. PT Mag. 1994:42;89-91.
(34) Palisano R, Murr S. Intensity of therapy services: what are the consider-ations? Phys Occup Ther Pediatr. 2009;29(2):107-112.
(35) Ideishi R, O'Neil M, Chiarello LA, Nixon-Cave K. Perspectives of therapist's role in care coordination between medical and early intervention services. Phys Occup Ther Pediatr. 2010;30(1):28-42.

There are numerous Web sites and publications available on this subject; this list is not meant to be all inclusive. Many of the listed sites have links to additional resources.

Developed by the Practice Committee of APPT, with expert contributors Maria Benedetto, PT, DPT, PCS, Amy Bailes, PT, MS, PCS, Shree Pandya, PT, DPT, MS, Patricia Edwards, PT, DPT, MS, PCS, and Catherine-Bookser-Feister, PT, MS, PCS.