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The interface of clinical decision-making with study protocols for knowledge translation from a walking recovery trial

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Abstract

Background and Purpose—Despite efforts to translate knowledge into clinical practice, barriers often arise in adapting the strict protocols of a randomized, controlled trial (RCT) to the

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individual patient. The Locomotor Experience Applied Post-Stroke (LEAPS) RCT demonstrated equal effectiveness of two intervention protocols for walking recovery post stroke; both protocols were more effective than usual care physical therapy. The purpose of this manuscript is to provide knowledge-translation tools to facilitate implementation of the LEAPS RCT protocols in clinical practice.

Methods—Participants from two of the trials' intervention arms: 1) early Locomotor Training Program (LTP) and 2) Home Exercise Program (HEP) were chosen for case presentation. The cases illustrate how the protocols are used in synergy with individual patient presentations and clinical expertise: the interface between implementation of an RCT standardized intervention protocol and clinical decision-making.

Outcomes—In each case, the participant presents with a distinct clinical challenge that the therapist addresses by integrating the participant's unique presentation with the therapist's expertise while maintaining fidelity to the LEAPS protocol. Both participants progressed through an increasingly challenging intervention despite their own unique presentation. Decision algorithms and exercise progression for both protocols are presented in an easy to implement format.

Conclusion—These case examples facilitate translation of the LEAPS RCT into clinical practice by enhancing understanding of the protocols, their progression, and their application to individual participants.

INTRODUCTION

Knowledge translation in physical therapy practice includes the dissemination and synthesis of knowledge to improve clinical practice.¹ Despite efforts to translate knowledge into clinical practice, barriers often arise in adapting the protocols of a randomized controlled trial (RCT) to the individual patient. One barrier to implementing results is that the interventions studied or tested are often poorly described.² Even when intervention protocols are reported, the decisions involved in their implementation with study participants are not always transparent.³

New, more meaningful ways of reporting research methodology need to be developed to facilitate the implementation of successful RCTs into clinical practice. As a part of their Knowledge-to-Action Framework, Graham et al⁴ have proposed development of knowledge tools or products such as decision aids to improve translation of knowledge to clinical practice. These tools support translation by presenting knowledge in clear and clinician-friendly formats. Case examples of clinical decision making are one such tool to customize dissemination of information from a large RCT to facilitate implementation by clinicians.⁴

Clinical decision-making and reasoning are key characteristics of physical therapy practice.^{5,6} However, decision-making in the context of a standardized intervention is rarely addressed in the publication of large trials. In fact, to our knowledge, no randomized controlled trials (RCT) in rehabilitation have described the decision-making involved in implementing the intervention on an individual basis. Especially with large RCTs, therapists perceive barriers to implementing interventions in practice, such as the inapplicability to individual patients.^{7,8} Illustrating the application and progression of a therapeutic

intervention within an RCT protocol to individual participants fulfills an unmet need of therapists aiming to translate successful RCT protocols into practice.

The LEAPS RCT provides a unique opportunity for development of knowledge translation tools for two successful intervention protocols. The trial compared two interventions to improve walking post-stroke: 1) a task-specific walking program that included stepping on a treadmill with partial body-weight support, followed by overground training (LTP), and 2) an impairment-based progressive flexibility, strength, and balance exercise program conducted in the home (HEP). The LTP and HEP programs were both successful in transitioning participants to a higher functional level of walking at 1-year post-stroke.⁹ Additionally, both interventions were superior to “usual care” physical and occupational therapy at 6 months post-stroke.⁹ While the locomotor training algorithms used in the LEAPS trial have been published previously,¹⁰ they have not been described specifically within the context of stroke rehabilitation. The home exercise program (HEP) protocol and algorithms have not been previously available. The protocol for the LEAPS trial intervention was published¹¹ and the primary analysis established protocol fidelity.⁹ Both intervention groups progressed as outlined in the protocol, making advances on all parameters of the LTP protocol and all activities in the HEP protocol. The locomotor training groups had significant increases in the duration of stepping time, decreases in body-weight support and the assistance required, and increases in speed ($P < 0.001$ for all three comparisons). The HEP group also made statistically significant progress in all activities.⁹ To maintain standardization fidelity, intervention teams met weekly with regional coordinators and investigators to discuss implementation of the protocols and to problem solve participant-specific challenges.

This manuscript presents two case examples that illustrate the interface between clinical decision-making and standardized intervention protocols for individual research participants. We also present the decision algorithms and exercise progression for both protocols in an easy to implement format.

The purpose of this manuscript is to provide a knowledge-translation tool to facilitate implementation of the LEAPS RCT protocols into clinical practice. Further, we hope to demonstrate the value of such tools and promote their replication by authors of other large RCTs.

Common challenges

While the LEAPS protocols provided the LEAPS therapists with algorithms and guidance for progression of treatment, participant-specific problems could present challenges to that progression. Weekly team discussion and confirmation from clinical site leaders revealed several common challenges encountered in implementing the study protocol. The three most frequently cited challenges included labile blood pressure and heart rate, upper and/or lower extremity pain, and severely impaired voluntary motor control. These challenges reflect common early post-stroke sequelae and clinical management challenges faced by physical therapists.^{12–15}

With the standardized protocol as a guide, the LEAPS therapists used clinical decision making to continually progress participants in the presence of these challenges. We provide specific examples here of this decision-making to facilitate translation of LEAPS protocols into clinical practice. In addition, because both interventions had successful outcomes when compared to usual care at 6 months post-stroke⁹, it is important to understand the common attributes or principles underlying the two different interventions that might not be present in usual care (e.g., intensity, standardized progression, challenge). Each case illustrates one principle of the LTP or HEP protocol using a clinical decision-making example.

METHODS

To demonstrate examples of clinical decision-making in the context of implementing a standardized intervention, two LEAPS participants were chosen, one from each of the early LTP and HEP groups. Participants were chosen by consensus of the five LEAPS site team leaders as representative examples of common challenges presented by participants during the trial. Demographic, intervention, and outcome data was obtained from the LEAPS Data Management Center. Clinician notes in the intervention and personal logs were reviewed to obtain participant goals, problems, or barriers that arose during training, and participant training strategies and cuing.

As a part of the LEAPS trial, all participants signed an informed consent form approved by the Institutional Review Board at their respective institutions. Participants were screened for inclusion criteria,¹¹ completed baseline assessments and were randomly assigned to the HEP, early LTP or late LTP group at 2 months post-stroke. Participants in the early LTP and HEP groups started the intervention at 2 months post-stroke. The protocol consisted of 36 visits, an average of 60–90 minutes each, over a maximum of 16 weeks (2–3 x/week). Subjects participated in any additional therapy as prescribed by their health care provider. LTP and HEP intervention protocol descriptions are provided (Online Appendices 1, 2 (Manual of Procedures HEP; Home Exercise Program Progression and Components of the LTP Intervention; See Supplemental Digital Content 2 and 3)¹⁶ and screening and randomization procedures have been published previously.¹¹

The two intervention protocols were guided by specific principles to direct participant progression (Figures 1, 2 and 3). The decision algorithms provided guidance to progress both interventions. Locomotor training principles were: 1) maximize lower extremity (LE) weight bearing, 2) provide appropriate sensory experience consistent with the task of walking (i.e. training at pre-stroke walking speed and facilitating weight acceptance), 3) optimize gait kinematics, and 4) maximize recovery and independence in walking; minimize compensation.^{10,16–18} HEP principles were: 1) individualized dosing (i.e. establishing number of repetitions and level of intensity based on the participants' level of impairment), 2) continuous progression of exercise via repetition, increasing resistance, or increasing task difficulty, and 3) quality of movement before progression (online appendices).^{19,20} These principles are highlighted and elaborated on in each case.

Cases

Participant 1: JH

Group Assignment: HEP

Background: JH was an active 48-year-old female with mild stroke impairment (National Institutes of Health Stroke Scale (NIHSS) = 1; minor facial paralysis)²¹ at 2 weeks post-stroke (Table 1, 2). Her 2-month post-stroke gait speed was 0.42 m/s. Her goal was to improve her overall strength and balance in order to resume use of public transportation.

Challenge: Progressing upper extremity strengthening in a participant with shoulder pain

Protocol and Participant Presentation: The LEAPS HEP is a progressive exercise program with continual progression of sitting and standing balance, and upper and lower extremity (UE/LE) coordination and strengthening exercises. It includes approximately 60–90 minutes of activity beginning with vital sign monitoring and stretching, but with the majority of the session dedicated to the exercise protocol. The protocol requires progression of exercise difficulty or number of repetitions at each session if the participant demonstrates appropriate quality of movement. However, in this case, during sessions 12–30 of the HEP, JH regressed in her upper extremity (UE) resistance exercises as she started to experience pain in her hemiparetic shoulder. The participant was receiving outpatient OT to address UE function at the time and she had recently resumed new functional activities at home such as cooking and cleaning. She reported anterior shoulder pain (5/10 on a visual analog scale) during these tasks, especially with shoulder flexion greater than 90 degrees. Observation of her mechanics for functional reaching revealed excessive scapular elevation and glenohumeral internal rotation with thoracic kyphosis.

Physical Therapist Decision Process: In the first session in which the patient reported the pain, the LEAPS therapist used clinical expertise to analyze her current exercises and movement to consider potential contributing factors and hypothesize the underlying mechanisms. The therapist considered potential hypotheses for the shoulder pain including biomechanical factors such as decreased scapular, thoracic and glenohumeral mobility, muscle imbalance and fatigue. The LEAPS HEP protocol does not include addressing shoulder pain. Therefore, the LEAPS therapist recommended that the participant obtain evaluation beyond what was a part of the LEAPS protocol, and discussed the problem with JH's outpatient therapists. After discussion with the outpatient therapists, the LEAPS therapist prioritized the hypothesis that the pain was perhaps due to overuse of her UE. Between LEAPS participation and her additional prescribed therapy, she completed almost daily UE exercises. UE fatigue may have contributed to the use of faulty mechanics with overhead reaching during functional activities in the evening at home. The protocol for continual progression of strengthening exercises was difficult to apply in this case. However, the principle of quality of movement could be emphasized to assist the patient in her kinematics to prevent pain. After consultation with the local LEAPS team and the multi-site group during the weekly team leader calls, the LEAPS therapist decided to discontinue resistive UE exercises but continue with active range of motion (AROM) exercises in pain-free range until the pain subsided. Stretching of upper trapezius and levator scapulae

muscles were also added to her warm up. During AROM exercises, the LEAPS therapist provided verbal and tactile cues for proper postural, scapulo-humeral, and scapulo-thoracic mechanics and explained to the participant how these could be used during all reaching activities. JH tolerated AROM exercises without pain; the number of verbal cues for posture and scapular movement during the exercises was gradually decreased until she performed them independently. Her overall flexibility also improved and she had improved scapular depression and upward rotation with reaching.

Outcome: Due to JH's shoulder pain, progression through UE exercises was slowed (Table 3). She ultimately progressed to performing UE exercises against gravity and with light resistance and progressed through all other exercises and balance tasks to nearly the highest level. The participant improved in all outcomes from baseline to 12 months post stroke, including her gait speed from 0.48 m/s to 0.78 m/s, her gait endurance, and the amount of daily walking. Though JH did not transition to a higher functional level of walking outcome (0.4–0.8 m/s to >0.8 m/s) at 12 months, her 0.35 m/s improvement was accompanied by a 10.1 point improvement in her perception of mobility on Stroke Impact Scale (SIS) Mobility Scale,²² which exceeded the minimally clinically important difference (MCID) of 4.5 in chronic stroke.²³ Of interest in this case, with regard to UE function, JH's SIS Hand Function, SIS ADL/IADL, and Fugl-Meyer (FM) UE Motor²⁴ score all improved from baseline to 12-months post-stroke (Table 2).

Clinical Key: In this case movement analysis of JH's reaching mechanics allowed the therapist to reorient the task to teach JH how to avoid compensation that may have led to shoulder pain. The clinical key illustrated to solve this problem is the prioritization of kinematics and flexibility to decrease pain in order to drive progression of strengthening activities.

Participant 2: BB

Group Assignment: LTP

Background: BB, a 65-year-old female, sustained a moderate stroke (NIHSS = 11) resulting in severe walking impairment (gait speed = 0.07 m/s, use of large base quad cane and rigid ankle foot orthosis (AFO)) and severe lower extremity (LE) motor impairment (12/34 LE Fugl Meyer) at baseline evaluation (Table 1, 2). Despite her low functional level, she met all inclusion criteria for the study. Her goals included regaining full independence for all activities and walking without an assistive device.

Challenge: Poor lower extremity motor control--is the participant ready for locomotor training?

Protocol and Participant Presentation: The LTP protocol includes 60–90 minute sessions of stretching/warm-up and locomotor training on the treadmill with BWS and overground. A primary principle is to maximize weight bearing through the paretic LE with progression of speed and maintenance of correct kinematics (Appendix 2B). BB demonstrated decreased paretic LE stance time with excessive trunk flexion and knee hyperextension during the first session of LTP. Palpation confirmed limited antigravity muscle control with minimal activity in the paretic LE hip extensors, abductors and plantarflexors during stance. In a clinical

scenario, the PT may question the patient's readiness for locomotor training in the face of such severe motor control deficits. However, the protocol did not allow for participants to delay training or participate in therapeutic exercise to improve motor control.

Physical Therapist Decision Process: In the first phase of training, the LEAPS protocol emphasizes a goal of locomotor training for 20 minutes total on the treadmill with good kinematics at 2.0 mph. As the algorithm indicates (Figure 2), assistance and BWS are increased and speed decreased in order to reach the walking time goal of 20 minutes. In order to address the problem of limited LE antigravity muscle control in stance, the LEAPS therapist decided to start the first sessions of training at 40% body weight support. This was the maximum BWS in the LEAPS protocol¹¹ and the BWS at which the participant demonstrated the most optimal kinematics. The team also used clinical expertise to determine that a decrease in the speed to approximately 1.2–1.4 mph helped to attain appropriate kinematics and allowed the participant to walk for 20 minutes. BB also completed gait preparatory activities in the support harness without BWS to encourage active trunk and hip extension without knee hyperextension to maximize weight bearing on the paretic LE. For example, tactile cues for trunk extension and paretic LE hip extension were provided while BB took a step with her uninvolved LE. The LEAPS therapist decided to prioritize the activation activities in an upright, weight-bearing position instead of stretching during the “warm-up” part of the locomotor training (not included in the overall gait training time). The preparatory activities are included as part of the LEAPS protocol.

Locomotor training commenced initially at slow speeds (1.2–1.4 mph) with attention to lengthening the non-paretic LE step length to increase stance time on the paretic LE while providing assistance at the hip and trunk for extension. This initially required three trainers (paretic limb, non-paretic limb and hips), which progressed to 2 trainers, (paretic limb and hip) over the first 12 visits once the participant had normalized kinematics and step length on the non-paretic limb (Table 4). The team progressed the amount of trainer assist concurrently with progression of the speed and BWS. As BB gained independent control of the hip and trunk in stance, BWS was progressively lowered over 35 sessions to a minimum of 15% (Table 4). In overground training, the LEAPS therapist used alternative assistive devices and AFOs to promote equal LE weight bearing and increased activation of the participant's paretic LE. The therapist determined that a more substantial brace (first a rigid AFO during sessions 1–24 and then articulating AFO in sessions 25–35) was indicated to provide knee and ankle control in stance during over-ground walking. During over-ground gait training, hand held assistance in front was used to discourage the asymmetrical pattern and trunk lean induced by the assistive device. A walking pole, held in BB's non-paretic UE, was used instead of a quad cane to promote a more upright posture.

Outcome: While BB demonstrated consistent progression of the training parameters across the sessions, progression was slow and limited by LE motor control deficits and her high Borg Rate of Perceived Exertion²⁵ with training. By her final session she progressed up to 30 minutes of total stepping time at 2 mph with 15% minimum body weight support, and minimum assistance at the hip and paretic LE. In addition her walking speed progressed from 0.07 m/s to 0.19 m/s. At the end of intervention she was walking independently in the

community with an articulating AFO and narrow base quad cane and had nearly tripled her average number of steps per day (547 initial steps to 1606 after intervention).

Clinical Key: In this case, the LEAPS protocol advocated progression of training for a participant with minimal LE motor control. The clinical key to solving this problem is the benefit of interplay of training on the treadmill and over-ground walking to promote activation of the paretic LE, specifically prioritizing activation activities that would promote LE activation during the “warm up” phase of the LTP protocol. Additionally, the LEAPS therapist used alternative assistive devices and AFOs to promote equal LE weight bearing and hence activation of the participant’s paretic LE.

Discussion

We present two examples of common challenges in rehabilitation seen post-stroke: paretic shoulder pain and poor LE motor control, and describe how these were addressed while maintaining protocol fidelity in a RCT. Both participants progressed through a structured program and improved in nearly all outcomes between baseline and 6 months post-stroke. The description of decision-making and progression of the participants through the locomotor training and home exercise program provide the clinician with useful tools to translate the protocol to practice.

As described in the Knowledge to Action cycle⁴, two distinct cycles (knowledge creation and the action cycle) are critical to achieve practice change. The knowledge tools described in this study will help drive clinical change at many steps of the action cycle. For example, when a clinician is presented with a clinical decision regarding progressing a patient post-stroke in locomotor training, they can better adapt the protocols from the LEAPS trial to their local context through the use of the algorithms and descriptions provided.

The usefulness of the type of knowledge tool described here is supported by recent studies of knowledge translation in healthcare. In a recent review, Pentland et al²⁶ recommend that evidence that is clearly summarized and provided in a simple format is more likely to be utilized by clinicians. In addition, they suggest that including description about how to address commonly encountered challenges in RCTs encourages clinical implementation. By applying these recommendations here to the LEAPS RCT, we hope to facilitate implementation of the LEAPS protocols into clinical practice.

As an important aspect of knowledge translation, Glasziou et al² recommend mapping components of interventions. This involves identifying similarities in order to understand the effective “ingredients”. The case examples provide an opportunity to explore the common components of two successful protocols for improving walking recovery post-stroke. Though designed to be distinct, the HEP and LTP protocols have several common elements that may have led to successful outcomes for both groups.⁹ First, in each case a LEAPS therapist applied a standardized protocol. Principles and decision-making algorithms derived from previously successful LTP^{10,20} and HEP¹⁹ intervention studies were used to guide clinical decision-making. Common themes guiding decision-making included optimizing quality of movement and maximizing use of the involved extremity in a safe and pain free

manner. Secondly, intervention difficulty was systematically progressed during each session, either by progressing number of repetitions, amount of resistance, task difficulty (HEP) or BWS, assistance, speed, endurance, and adaptability (LTP). Finally, the intervention, though standardized, was individualized to each participant's clinical presentation and goals.

Strict adherence to the protocol in this multi-site RCT was critical to the integrity of the results. Rigorous therapist training prior to starting the trial and ongoing mentoring throughout facilitated a successful merger of clinical decision-making and protocol adherence to maintain consistent implementation of the protocol across sites.

Limitations

A limitation of this report is that the selection of these two cases reflected a consensus of trial personnel and was not empirically based. Another limitation of this study is that the LEAPS teams had the benefit of a team-based approach to clinical decision-making that is not always available to individual clinicians. Finally, a knowledge translation framework was not used as a part of the LEAPS trial implementation process and we recognize this may have helped to frame the process for the LEAPS therapists in developing knowledge tools.

To our knowledge, this is the first knowledge translation tool created through report of case examples from an RCT to explore clinical decision-making of individual participant problems. We have described decisions related to progression of training with specific participant problems in both HEP and LTP interventions. Future investigations that aim to apply the LEAPS decision making and protocol algorithms to individual patients in clinical practice may provide further insight into the usefulness of providing case examples as a knowledge translation tool.

Conclusion

These case examples facilitate translation of the LEAPS RCT into practice by enhancing understanding of the protocols, their progression, and their application to individual participants. In RCTs, a standardized protocol is required to ensure intervention fidelity. However, as we have demonstrated, implementation of a standardized protocol requires clinical decision-making by which therapists accommodate individual participant presentations. These cases provide an additional important component of reporting from the LEAPS RCT, illustrating the clinical decision-making process used to implement the HEP and LTP intervention protocols. These case examples provide a knowledge translation tool to facilitate the translation of the LEAPS RCT interventions into clinical practice.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.
Decision-making processes for progression of home exercise program training.

Figure 2. Decision-making processes for progression of step training and community ambulation training. BWS = Body-weight support

Figure 3. The two components of locomotor training. (a) Step training on a treadmill. (b) Community ambulation training.

Table 1

Participant Characteristics

	Participant 1-JH	Participant 2-BB
Group	HEP – Moderate	LTP – Severe
LEAPS Site	University of Southern California PT Associates	Florida Hospital Rehabilitation and Sports Medicine
Age/Sex	48/Female	65/Female
Race	Native Hawaiian or Other Pacific Islander	Black or African American
Stroke Location	Left Hemisphere	Right Hemisphere
Stroke Impairment (NIHSS)	1	11
Significant Past Medical History	TIA, smoker	High cholesterol, drinks alcohol
Premorbid Short-Health Survey (SF-36) Physical Function Subscale (max = 30)	28	30
Prior level of function	Employed full-time, physical activity 3 times/week	Employed full-time, physical activity 3 times/week

Table 2

Baseline (2 month), 6-month and 12-month post-stroke scores on key participation, activity and body structure function measurements.

	Participant 1-JH, HEP Moderate			Participant 2-BB, LTP Severe		
	Baseline	6 month	12 month	Baseline	6 month	12 month
10 meter walk (m/s)	0.43	0.79	0.78	0.07	0.18	0.19
SIS Participation (max = 100)	98.3	96.6	100.0	62.5	87.5	87.5
SIS Mobility (max = 100)	86.1	83.3	97.2	94.4	83.3	80.6
SF-36 Physical Function Subscale (max = 30)	26	29	28	12	21	23
Berg Balance Scale (Max = 56)	49	55	53	41	41	43
Activities Specific Balance Confidence Scale (Max = 100%)	80.7	88.0	93.3	31.3	55.7	73.7
Fugl Meyer UE Motor (max = 66)	58	57	61	2	8	8
Fugl Meyer LE Motor (max = 34)	24	29	27	16	16	10

Table 3

HEP Progression for Participant 1-JH, HEP Moderate

Exercise	Starting Level	Max Exercise Level	Exercise Level
Balance			
Sitting Balance	Sitting with upright posture, shift weight laterally to nonparetic hip, etc. Hold 5 seconds	Ipsilateral posterior diagonal reaching/paretic UE	8
Static Standing Balance	Feet together for 30 seconds, weight evenly distributed with eyes close	Staggered stance for 30 seconds, paretic leg in front on step, weight evenly distributed with eyes open	7
Dynamic Standing Balance	Catching ball straight on	Turning towards nonparetic side	4
UE Exercise			
Shoulder flexors (limit to 90°)/Shoulder extensors	Against gravity	Against gravity/Against gravity, Yellow	10 [*] / 1
Shoulder external rotators/Abductors	Against gravity, Yellow/Against gravity	Against gravity, Yellow/Against gravity	5 [*] / 10 [*]
Elbow flexors/Extensors	Against gravity	Against gravity, Red/Against gravity, Yellow	2/ 1
Wrist extensors/Flexors	Against gravity, Yellow	Against gravity, Red	1/ 1
Mass finger extension/Flexors	Against gravity/Gravity eliminated - active	Against gravity, Yellow/Gravity eliminated - active [§]	1/ 0 [§]
LE Exercise			
Hip abductors	Against gravity, standing	Against gravity, sidelying	1
Hip flexors/Extensors	Supine: straight leg raise/Supine: bilateral bridge	straight leg raise, Red/Standing	2/ 3
Knee flexors/Extensors	Supine heel slide, active/Sitting	Sitting, Red	3/ 2
Ankle dorsiflexors/Plantarflexors	Sitting, active assistive/Sitting active	Sitting, Yellow/Standing, no support, raise up on toes both feet	2/ 3
Lower Extremity Coordination/Upper Extremity Coordination	supine heel -shin-knee/sitting, finger-nose-finger	supine heel -shin-knee [§] /sitting, finger-nose-finger [§]	6 [*] / 6 [*]
Sit-to-Stand	Edge of chair, forward lean, push up both arms	Sit back in chair, put arms out, stand up	4

[§] indicates ceiling effect^{*} indicates repetition change

Table 4
LTP Progression through sessions for participant 2—BB, LTP Severe (mean [min, max])

Assist: 1= min assist to supervision; 2= mod assist; 3= max assist; 0= no trainer

	Participant 2—BB, LTP Severe		
	Sessions 1–12	Sessions 13–24	Sessions 25–36
Total Step Time (minutes)	25.6 [10, 30]	25 [6.8, 30]	25.5 [22, 30]
Body Weight Support (%)	32 [28, 40]	27 [24, 30]	20 [15, 24]
Maximum Training Speed (mph)	1.68 [1.2, 2]	1.72 [1.3, 2]	1.81 [1.5, 2]
Hip Assistance	3 [1, 3]	1 [1, 2]	1 [1, 2]
Paretic Assistance	3 [2, 3]	2 [1, 3]	3 [1, 3]
Nonparetic Assistance	0 [0, 1]	0 [0, 0]	0 [0, 0]
# of Training Bouts per Session	3.4 [2, 5]	3.6 [2, 4]	3.4 [3, 4]
Number of Rests per Bout	0 [0, 1]	0 [0, 1]	1 [0, 2]
Borg Rate of Perceived Exertion (RPE)	17 [13, 19]	17 [13, 19]	16 [15, 19]
Time Spent Overground Training (minutes)	14.8 [12, 20]	13.2 [8, 20]	11.9 [6, 15]