

ARTICLE



# Activity-based therapy for individuals with spinal cord injury/disease: perspectives of acute care therapists

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**STUDY DESIGN:** An exploratory descriptive study was conducted.

**OBJECTIVE:** To determine if and how occupational therapists (OTs) and physical therapists (PTs) in acute care hospital settings use activity-based therapy (ABT) and its associated technologies.

**SETTING:** Acute care hospital settings in Canada.

**METHODS:** Semi-structured interviews were conducted with physical and occupational therapists, licensed in Canada, who worked in an acute care neurological setting with individuals with spinal cord injury or disease (SCI/D). To analyze the data, interpretive description was used. NVivo 12 was used for data management.

**RESULTS:** Five physical therapists and two occupational therapists were interviewed ( $n = 7$ ). Two therapists declined after reading a description of the study. Through analysis, the following themes were identified as affecting the delivery of ABT as part of SCI/D rehabilitation in the acute care setting: (1) Impact of patient acuity on ABT participation, (2) ABT approach unique to the acute care setting, and (3) Influence of acute care work environment and therapy practice. Throughout these themes, therapists referred to dosage as a limiting factor affecting ABT delivery.

**CONCLUSIONS:** Our research reveals that implementing ABT in an acute care setting is challenging considering the high dosage of movement practice required for ABT. To increase dosage and the use of ABT in acute care, strategies could include early patient education on ABT, strategic use of social supports, and use of portable technology already incorporated in acute care.

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## INTRODUCTION

Individuals with spinal cord injury or disease (SCI/D) experience movement deficits, which affect functional goal achievement. A current approach to regaining motor function after SCI/D is activity-based therapy (ABT). Guided by principles of neuroplasticity, ABT is task-specific and involves a high training dosage (i.e., high number of movement repetitions, frequency and duration of sessions, and/or exercise intensity) [1–3]. A defining feature of ABT is neuromuscular activation below the level of spinal injury, which may be facilitated by technology, such as neuromuscular electrical stimulation [4]. This type of therapy is considered necessary to enhance neurorecovery and restore function after SCI/D; [5] individuals who engage in ABT see it as a critical part of their rehabilitation [6].

Canadians with SCI/D mainly access ABT in the private sector following hospital discharge [6–8]. ABT-specific clinics exist, where ABT is well-understood and associated technologies are commonly used [7]. In contrast, access and understanding of ABT is

diverse in rehabilitation hospitals, where therapists typically find ABT difficult to implement due to a variety of factors. These include patient characteristics, goals of inpatient rehabilitation, norms of each hospital site, and access to the resources perceived necessary for the delivery of ABT [8].

Individuals with SCI/D, who have been exposed to ABT, have expressed a desire to start ABT as early as possible in the continuum of care [6]. Yet, little is known about the content of SCI/D rehabilitation programs early after SCI/D, in acute care settings. It has been suggested that ABT in the acute care setting could involve preparing patients for ABT later in the continuum of care [9]. For example, including range of motion exercises to prepare patients physically, or educating patients to prepare them mentally to engage in ABT at a later stage of rehabilitation. There is no formal research into how ABT is used in acute care. The purpose of this study is to determine if and how occupational therapists (OTs) and physical therapists (PTs) in acute care hospital settings use ABT and its associated technologies.

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## METHODS

### Study design

This was an exploratory qualitative study approved by the Research Ethics Board of the University Health Network. All participants provided written consent to participate.

### Participants

Members of the research team (CH, JFL, KW) approached potential participants within their networks using snowball sampling. Participants had to (1) be licensed to practice as an OT or PT in Canada and (2) work in an acute care hospital setting with patients with SCI/D.

Sample size was calculated using the concept of 'information power [10]'. This concept suggests that the larger the amount of information power the sample holds, the lower the  $N$  required. Information power is based on an assessment of study aim, sample specificity, use of established theory, analysis strategy, and quality of dialog. First, our study aim was narrowly focused on the perspectives of Canadian OTs and PTs who work with patients with SCI/D in the acute care environment. Second, these participants were selected for characteristics that were highly specific to the study aim. Third, the Theoretical Domains Framework (TDF) is an established framework that contributed to the study design, specifically to the development of the interview guide. Fourth, our study involved a cross-case analysis. Lastly, an experienced female qualitative researcher (HJR) facilitated the interviews. The researcher's experience enabled her to elicit a depth of information from the interview dialog. The results of this assessment suggest that the sample held a large amount of information power; hence the sample size, although relatively small ( $n = 7$ ), had the depth to achieve the study objectives.

### Data collection

Semi-structured interviews with participants were facilitated over the phone by one or two graduate student researchers with a physical therapy background (HJR, NG). One interview involved two participants who worked in the same facility. The interviews were recorded and then transcribed verbatim. The duration of the interviews ranged 17–40 min. Data were collected from February–November 2020. Throughout data collection and analysis, a reflexive journal was maintained by HJR.

The interview guide was composed of open-ended questions about ABT practice and associated technologies in acute care. This guide was based on a previous guide developed for interviews with therapists at rehabilitation hospitals using the TDF [8, 11] (see Table 1). To begin, the researcher provided a common definition of ABT and continued to propel the discussion using a combination of questions from the guide and the natural course of conversation.

### Data analysis

For data analysis, interpretive description was used. This methodology is situated within an interpretivist paradigm. Interpretive description is appropriate to investigate health phenomena and to determine implications for clinical practice [12]. Two authors (HJR, NG) created marginal memos and highlighted key quotes to sort the data. As interviews aggregated, these authors used constant comparison to determine broad-based coding. They met collectively with a third researcher (KEM) to discuss themes, categories, and subcategories using an iterative approach. Because these researchers had a physical therapy background, another researcher (CM) contributed feedback to provide a different perspective. CM has worked as a researcher in the field of SCI/D rehabilitation and biomedical engineering for 25 years. Study participants were also contacted to provide member reflections relating to their interviews. We enhanced the trustworthiness and credibility of our data analysis by recording an audit trail and using NVivo 12 for data management.

## RESULTS

Nine therapists expressed interest in participating. Two declined after reading the study description as they did not have any experience with ABT. Seven participants from six sites spanning four Canadian provinces were included in this study. Five of them were PTs and two OTs, with 1 male and 6 females.

Three themes were identified through the analysis: (1) Impact of patient acuity on ABT participation, (2) ABT approach unique to the acute care setting, and (3) Influence of acute care work

environment and therapy practice. See Table 2 for themes, categories and supporting quotes.

### Impact of patient acuity on ABT participation

Acuity refers to the severity of the SCI/D and the level of care that an individual requires from the medical staff. The acuity of the patient impacts their ability to participate in ABT.

Safety: *"If they're in ICU, the goal obviously is to stabilize them and to save their life". (OT, Site 5).*

The patient's safety was the most important consideration for acute care therapists across all sites. Some patients entered an intensive care unit (ICU) to be stabilized before engaging in therapy. In other cases, patients who were on the acute care unit experienced an emergency medical event such as respiratory failure (Q1, Table 2). If an event like this occurred, the patients' safety was prioritized, and they were sent back to the ICU while therapy was discontinued. This cycle could repeat, disrupting the opportunity to engage in ABT.

Tolerance: *"In the acute phase it's so exhausting for them to do 20–30 min, right? It's just exhausting for them". (OT, Site 5).*

Therapists observed that patients had to build tolerance to therapy. Otherwise, patients might experience signs and symptoms such as hypertension, dizziness, or respiratory difficulties (Q2). Several therapists were concerned that patients could not meet the dosage required for ABT due to a lack of tolerance. One therapist determined that a general tolerance level was needed as a prerequisite (Q3). Patients were only able to engage in therapy for short periods and they could not perform multiple sessions (Q4).

"Clean" versus "complex" patient: *"A young person with a paraplegic level of injury, without any other sort of trauma going on—that's a very clean injury so to speak". (OT, Site 1)*

Acute care therapists also distinguished between a "clean patient" and the potential limitations of a "complex patient," (OT, Site 1), which were factors impacting exposure to ABT. A patient with a clean injury might have a short length of stay (e.g., two weeks) (Q5). This quick discharge suggests that the patient might have been a good candidate for ABT, but there was not enough time to introduce ABT into their acute care program. A complex patient could stay up to a year; however, other factors, like a respiratory emergency, might disrupt or prevent ABT from being started (Q6).

### ABT approach unique to the acute care setting

Therapists may prepare patients by educating and physically preparing them for ABT. The role of the patient's social support is critical for accessing ABT in acute care. Although therapists provide patient education on ABT, they would also like education on ABT designed specifically for acute care therapists.

ABT definition: *"We do work underneath the spinal cord injury level, but I don't know if I would actually describe it as ABT" (PT, Site 6)*

Most sites incorporated some form of ABT into therapy sessions but were hesitant to say that it met the definition provided. Many therapists expressed difficulty applying ABT in acute care, specifically that they could not meet the intensity requirements (Q7). Occasionally, the ABT definition was well-understood, and therapists described doing functional activities with their patients (Q8).

Preparation of patient for ABT: *"When they cross that threshold [sitting up in bed] they can start with ABT, even if it's the simplest version of that". (OT, Site 1)*

Therapists suggested that physical conditioning, along with education, could prepare patients for ABT. For example, some therapists noted sitting as a prerequisite for feeding, which is an indication that ABT activities like strengthening and functional electrical stimulation can be added (Q9). Therapists also felt that it was important to educate patients about their SCI/D and physical function (Q10).

**Table 1.** Interview questions mapped to Theoretical Domains Framework (TDF) [11].

Questions	Mapping to TDF domains
1. Do you and your colleagues use ABT at your site? - For what therapeutic goals? - At what stage(s) of recovery after SCI/D? - For which patients with SCI/D (paraplegia, tetraplegia, AIS rating)?	Environmental context & resources; goals; knowledge; attention, memory & decision processes
2. What equipment is used to retrain sitting and standing balance? - How is this equipment/technology used? - Is this piece of equipment/technology used by most physical/occupational therapists at your site? - At what stage(s) of recovery after SCI/D? - For which patients with SCI/D? - Repeat for the following therapeutic goals: walking, lower limb strengthening, wheelchair propulsion, upper limb function, upper limb strengthening, and fitness.	Environmental context & resources; knowledge
3. <i>If you have no equipment or technology to support ABT, are you able to perform ABT?</i> - <i>How do you do that?</i>	Knowledge; beliefs about capabilities; social influences
4. <i>If you are not able to perform ABT, why not?</i> - <i>How do you think that we could implement ABT and/or technology to support ABT in an acute care setting?</i>	Environmental context & resources; goals; knowledge; skills; social/professional role & identity; beliefs about capabilities; optimism; beliefs about consequences; reinforcement; social influences; emotion; behavioral regulation
5. <i>Is ABT and any associated technology used for any other purposes?</i>	Knowledge
6. What things have helped you use these equipment/technologies?	Knowledge; attention, memory & decision processes
7. Have you experienced any challenges when trying to access ABT and technologies that support ABT at your place of work?	Environmental context & resources; goals; knowledge; skills; social/professional role & identity; beliefs about capabilities; optimism; beliefs about consequences; reinforcement; social influences; emotion; behavioral regulation
8. Have you experienced any challenges when using ABT and technologies that support ABT?	Environmental context & resources; goals; knowledge; skills; social/professional role & identity; beliefs about consequences; reinforcement; social influences; behavioral regulation
9. Do your patients have access to ABT and/or technologies that facilitate ABT transfer to inpatient/outpatient rehabilitation?	Environmental context & resources; goals; knowledge
10. Regarding ABT in a community setting: To your knowledge, have your patients experienced difficulty accessing ABT and/or technologies that facilitate ABT in the community, after discharge from inpatient/outpatient rehabilitation?	Environmental context & resources; knowledge; optimism; social influences
11. How could access to ABT and the associated technologies, whether while in <i>acute care</i> , hospital, or community-dwelling, be increased for people with SCI/D? - What supports would help you sustain the use of ABT? - What supports would help you incorporate ABT-related technology into your clinical practice?	Environmental context & resources; knowledge; reinforcement; social influences; skills; social/professional role & identity; beliefs about capabilities; beliefs about consequences; optimism; memory, attention & decision processes; emotion; behavioral regulation
12. Would you like to increase your use of ABT and/or technology in your clinical practice? - If yes, in what way?	Goals; beliefs about capabilities; beliefs about consequences; optimism; intentions; behavioral regulation

Questions and probes in italics appeared in the acute hospital setting interview guide only. All other questions appeared in both the acute and rehabilitation hospital interview guides [8].

Hands-on/portable technology approach: *"We will use neuromuscular electrical stimulation in the intensive care unit". (PT, Site 3)*

Therapists preferred to provide a hands-on approach to ABT that might involve small portable equipment, like a handheld electrical stimulation device (Q11). These devices were often shared, and recently enhanced cleaning protocols due to the COVID-19 pandemic made their use more challenging.

Role of social support: *"I will give a program to family to do with the patient to bridge...the wait between going home and going to the outpatient program". (OT, Site 5)*

Therapists relied on patients' social supports to increase the frequency of therapy during acute care and transitions in care. If

the acute care therapy team included ABT during the day, it was beneficial for the patient to have their loved ones deliver ABT in the evenings and on weekends (Q12). To achieve the dosage needed for ABT within the acute care setting, it was important for the patients' social supports to supplement therapist-led sessions.

Therapist education and guidelines: *"I think maybe we just need more education on what [ABT equipment] we could use in our setting" (PT, Site 2)*

Therapists wanted more education about ABT. Some therapists did not know what equipment was available and subsequently how it might be used for ABT (Q13). Others were unaware of the research evidence validating ABT for individuals with SCI/D (Q14).

**Table 2.** Themes, categories, and quotes.

Category	Quote number	Quote
Theme 1. Impact of patient acuity on ABT participation		
a. Safety	Q1	"From a respiratory point of view, they crash, then that's when they'll go down to the ICU and then they'll come back up again and when patients have a big crash like that then you're resetting the clock every time because they've got to start again when they come back up to us." (OT, Site 1)
b. Tolerance	Q2	"We do need them to tolerate up to an hour treatment without having hypertension, being dizzy, and having respiratory issues [because] our goal is to get them ready for rehab." (PT, Site 6)
	Q3	"To do ABT you need to maintain trunk range of motion and a general activity tolerance." (OT, Site 1)
	Q4	"Our patients just don't have the energy initially. So, we can't be pushing it multiple times a day too, you know?" (OT, Site 5)
c. "Clean" vs. "complex" patient	Q5	"If you have someone new with a very clean injury almost ready to go and rehab can take them quickly, they can go within say two weeks of admission from us but that would also suggest that patient is more ready sooner to start ABT therapy, certainly." (OT, Site 1)
	Q6	"Other patients we've had for a year before they go to rehabilitation. Those ones are the patients whose spinal cord injury tend to be higher level-cervical level. They tend to be more injured when they show up with post trauma, a high-speed car accident rollover something like that and then usually those patients run into a lot of respiratory problems (OT, Site 1)
2. ABT approach unique to the acute care setting		
a. ABT definition	Q7	"You know I think when you look at the effectiveness of [ABT] and the high intensity that's needed, unfortunately we just can't provide that amount." (PT, Site 4)
	Q8	"We do a lot of ABT, but not technology based. It is a lot of fun stacking cones, playing cards because that's entertainment for them too." (OT Site 5)
b. Preparation of patient for ABT	Q9	Once they can tolerate a more upright position because it's hard to feed otherwise, then I can assess what level they're at as far as function goes. Strength goals and then start the FES. (OT, Site 5)
	Q10	"There's a large component of education to our program, so constantly educating the patient on their injury to their spinal cord and what it means to their physical function." (PT, Site 4)
c. Hands-on/ portable technology approach	Q11	"It's extremely challenging in our setting because it does require a lot of energy and equipment. The FES, the muscle stim, is quite small and it doesn't require too much space but in order to set it up we only have one device between 6 therapists at times. The electrode pads and all of the cleaning now with COVID and everything like that has been a little bit of a challenge." (PT, Site 4)
d. Role of social support	Q12	"Patients who are using, those who are needing that kind of stuff – the intensity we will provide it. When we do provide it, it's once with us, our therapy assistant, and once with ideally the patient's family. Because once a day is inadequate, right? As we all know it's about repetition. So, we try to teach them to have their families set up and do it with them. Especially on the weekend when we're not there. Then we try to get family to buy them some of those basic items that we use. They can do it with their family members on the weekend minimum twice a day." (OT, Site 5)
e. Therapist education and guidelines	Q13	"So, it's the question maybe of the lack of knowledge of what [ABT equipment] exists out there." (PT, Site 6)
	Q14	"If [ABT] was shown to actually improve the outcome of the patients that we're seeing I'd definitely be open to adding it to my practice." (PT, Site 2)
	Q15	"That's one thing we've always found, is clinicians working in acute care, there is very little adapted type of training for people who work in acute care, in anything in physiotherapy, it's mostly always external or rehab." (PT, Site 6)
	Q16	"I think probably we could maybe start some of the muscle stim stuff if it was recommended by the College [of Physiotherapists of (province)] or spinal cord rehab. We can maybe initiate that at our site for people- maybe with paraplegics as a starting point." (PT, Site 2)
3. Influence of acute care work environment and therapy practice		
a. Personnel	Q17	"If we were going to introduce ABT, that (acute care priority) list of things that we do, it can always be up for discussion, and I think we have the freedom and the autonomy to set those kinds of priorities and so on. So, I certainly think that we could have those kinds of conversations and see what's what." (OT, Site 1)
	Q18	"Usually, we have to track down the surgeon or the main physician to get an order." (PT, Site 3)



Table 2. continued

Category	Quote number	Quote
	Q19	"Upper extremity tends to be done by the OT [in the] acute care setting but not exclusively. We DO NOT divide the body in our acute care site". (PT, Site 5)
	Q20	"When we have a lot of time the sky's the limit. We could probably do anything we want [provide ABT and associated technologies], and we have a lot of supporting staff around us- the doctors, our physiatrist. They're all very passionate about their jobs. So, if there's something there that would be interesting that we feel we could implement, I'm sure it would work". (PT, Site 6)
b. Goal and caseload balance	Q21	"If someone is on vacation or calls in sick, I have to pick up their unit to coordinate too. So, I [coordinate] sometimes 40-50 beds and coordinate another 30 beds on my own. So, time and access to me is very difficult. Not that I'm that important, but that's my reality in an acute care setting and it's even worse with the COVID with mandatory isolation if anybody's exposed. It can be very challenging". (OT, Site 5)
	Q22	"Especially in acute care they focus on discharging all patients that can be discharged first. Those are your priorities and then treatment comes after that". (PT, Site 3)
c. ABT suitability for the work environment	Q23	"Then you can come back to your spinal cord injury population once you've taken care of call bell and skin where there's tetra or para. And then you're off to do your elective kind of stuff and you can come back to your deficit population depending on if you have time. So, upper extremity splinting for the tetras, power mobility seating, power mobility driving, vendor selection for future equipment needs, home care, OT referrals for home accessibility assessments, spinal cord injury education, including referral to peer mentor would be the top priorities for both [paraplegic and tetraplegic] populations.(OT, Site 1)
d. Lack of continuity	Q24	"We're the specialized acute care center and the patients all get sent to the internal center, which is a specialized center in [city] as well, so they will continue that type of [activity-based] therapy for sure". (PT, Site 6)
	Q25	"I only see acute care rehab patients. Even if they come back into acute care, but they don't have a spinal cord need...it's considered a medicine-related issue. They don't come to me, and I can't follow them either. They're not my patient". (OT, Site 5)

In general, therapists had a specific desire for educational materials to be tailored to the acute care setting (Q15). They also suggested acute care-specific guidelines to help them understand when and how to initiate ABT (Q16).

### Influence of acute care work environment and therapy practice

An individual may receive ABT in acute care; yet, the decision to provide ABT depended on the potential influence of other personnel. Goal and caseload balance also determined if, and how often an individual engaged in therapist-directed ABT. Noted challenges were the suitability of the acute care work environment for ABT, and the lack of continuity between the acute care environment and other settings along the care continuum.

Personnel: *"I have to check with the medical team if [ABT] is appropriate just in case they have some heart conditions that might make that worse, right?"* (OT, Site 5)

Therapists were considered autonomous within their departments (Q17); however, because of the nature of acute care, many sites required physician clearance to perform ABT(Q18). Most sites described working together across disciplines (Q19) and being supported by a passionate group of clinicians (Q20).

Goal and caseload balance: *"[Caseload] can be unpredictable. You can come to work and you kind of know what your day is going to be like and then by 9:30[am] you're already off the tracks".* (OT, Site 1)

Caseloads were typically large and unpredictable for several reasons. Therapists were expected to cover caseloads of colleagues who were sick or on vacation (Q21). Within their caseloads, therapists had to prioritize discharging patients over providing therapy (Q22).

ABT suitability for the work environment: *"Staffing and patient flow tend to be the bigger elephants in the room, unfortunately".* (PT, Site 4)

Taken together, staffing limitations and patient flow had a large impact on therapy delivery, which also impacted ABT

implementation. Most sites found ABT could be flexible in how it was used; yet many sites found that workflow prevented ABT (Q23).

Lack of continuity: *"We can't really speak to [ABT use in the community] because we don't really follow up with them after they've been discharged from acute care".* (PT, Site 2)

Continuity of care and communication with other settings (e.g., inpatient and outpatient rehabilitation, community), as well as knowledge about resources in those settings affected decisions about ABT delivery in acute care. Most therapists expressed a disconnect between acute care and other healthcare settings after their patients were discharged. One exception was specialized units for SCI/D (Q24). This therapist commented that the relationship between centers could provide an opportunity for continuity of ABT. Unfortunately, therapists working on mixed neurological units were often prevented from following patients due to rules and guidelines (Q25).

### DISCUSSION

Therapists described three overarching themes that affected ABT delivery as part of SCI/D rehabilitation in the acute care setting. First, patients' acuity often fluctuated, with safety considerations, physical tolerance, and injury complexity affecting ABT participation. Second, the approach to ABT was unique to acute care. In this setting, therapists prepared patients for ABT by focusing on functional goals using portable approaches. Lastly, there was an influence of the acute care work environment and therapy practice. Personnel structure varied and the balance between therapy goals and caseload management was difficult, impeding workflow and ultimately disrupting ABT continuity across the continuum of care.

According to our findings, implementing ABT in an acute care setting is challenging considering the high dosage of movement practice characteristic of ABT. Our participants highlighted patient acuity as a major limiting factor; however, they also

noted that “clean” patients may be ready for ABT during this phase. In prior research, ABT, such as FES cycling and exoskeleton-assisted walking (EAW), has been implemented as early as 2–3 weeks after SCI/D respectively with individuals living with paraplegia or tetraplegia [13–15]. Individuals with acute SCI/D typically engaged in three FES cycling or EAW sessions per week for at least eight weeks of up to 30–60 min [13–19]. Across 54 participants, there were few drop outs [13, 15, 16], if any [14, 17–19] with five serious adverse events (i.e., periarticular ossification, heterotopic ossification in unstimulated thigh, hematoma, deep vein thrombosis) that potentially related to FES cycling [13, 14, 16, 19]. Similarly, exercise, which often involves repetitive and intensive movements like ABT, has been initiated early after SCI/D (i.e., between five weeks and six months) resulting in positive effects on both muscle function and body composition [20]. Together, these findings suggest that ABT could be feasible for some patients in acute care.

Another factor limiting implementation of ABT in acute care, according to our participants, was the trade off between therapy goals and preparing patients for discharge. This trade off was also noted as a challenge by rehabilitation hospital therapists [8]. Likely, increases in admission numbers and decreases in length of stay for individuals with SCI/D have contributed to this limiting factor [21, 22].

Understanding the above-mentioned barriers to the implementation of ABT can help clinicians determine how ABT may fit within an acute care environment. Participants highlighted several strategies, including the use of portable equipment, like hand-held NMES or FES devices. These devices have been used in acute settings for specific applications; for example, to address respiratory function early after SCI/D [23] and hemiplegic shoulder in acute stroke [24]. In prior work, acute care therapists also reported that using FES to assist with therapy was less physically demanding [25], which may be an important consideration when engaging in ABT with patients in the acute phase of recovery.

Our results suggest that therapists were often part of ‘passionate groups’ willing to learn about ABT, who wanted education specific to acute care. The first step to providing patients with ABT education is to ensure that therapists have current evidence-based knowledge. Knowledgeable therapists can act as a resource for patients who want to know more about ABT. For some individuals with SCI/D, education may increase motivation; however, individuals with SCI/D may be overwhelmed with information in the acute setting [26]. Nonetheless introducing ABT in acute care could be part of a holistic education strategy across the continuum of care.

Social support was mentioned in our study as a facilitator to ABT delivery in acute care. Research has shown that individuals with a recent SCI/D who have low levels of functional ability can have high levels of life satisfaction with social support [27]. However, patients should actively engage with their social support to shape their own role in their recovery [28]. Engaging with social supports to supply more ABT sessions could help to facilitate ABT through the continuum of care.

There were some limitations to our research. Our participants were part of the researchers’ existing networks; therefore, we did not capture perspectives outside of those networks. Interviews were completed over the phone, which meant that non-verbal cues were not observed. However, this strategy enabled us to include therapists from across the country and to continue with data collection during the COVID-19 pandemic.

Acute care therapists face significant challenges to ABT implementation due to the acuity of the patient, the approach to ABT in acute care, and the influence of the work environment and therapy practice. These themes reflect factors that limit therapists’ ability to achieve the dosage required to perform ABT in acute care. Our research suggests that early patient education on ABT, strategic use of social supports, and use of portable

technology could be useful strategies to increase use of ABT in acute care.

## DATA AVAILABILITY

The datasets generated and/or analyzed during the current study are available from the corresponding author on reasonable request.

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## AUTHOR CONTRIBUTIONS

HJR contributed towards study design, data collection and analysis, interpretation of results, and writing and revising the manuscript. NG contributed towards data collection and analysis, interpretation of results and revising the manuscript. KW contributed towards study design, participant recruitment and revising the manuscript. JFL contributed towards participant recruitment and revising the manuscript. CH contributed towards participant recruitment and revising the manuscript. CM contributed towards data analysis, interpretation of results, and revising the manuscript. KEM contributed towards study design, data collection and analysis, interpretation of results, and writing and revising the manuscript.

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## COMPETING INTERESTS

The authors declare no competing interests.

## ETHICS APPROVAL

This research study was approved by the Research Ethics Board of the University Health Network, Toronto, ON, Canada.

## ADDITIONAL INFORMATION

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