ORIGINAL REPORT

PHYSICAL THERAPISTS' PERCEPTIONS AND USE OF STANDARDIZED ASSESSMENTS OF WALKING ABILITY POST-STROKE

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Objectives: **To determine physical therapists' perceptions and use of standardized assessments of walking ability post-stroke.**

Design: **Cross-sectional survey.**

Methods: **A questionnaire was posted to physical therapists in neurological practice registered in Ontario, Canada (*n*=1155). Of the 705 responders, 270 treated adults with stroke and completed the questionnaire.**

Results: **Assessment tools most frequently used with >6/10 patients were the Chedoke-McMaster Stroke Assessment (61.1%), Functional Independence Measure (45.2%), and gait speed test (32.2%). Only 11.1% consistently used the 6-minute walk test. The tools were used to evaluate (44.6%), monitor change over time (42.9%), form a prognosis (19.4%) or judge readiness for discharge (28.4%). Some therapists (40.1%) were unaware or unsure that valid and reliable measures of walking exist. As many as 80.5% of respondents agreed or strongly agreed that clinical practice guidelines should recommend specific measures of walking ability for use post-stroke.**

Conclusion: **A moderate number of physical therapists consistently use standardized assessment tools to evaluate or monitor change in walking limitation post-stroke. Interventions to improve use must increase awareness, in addition to the perceived relevance and applicability, of recommended assessment tools.**

Key words: questionnaire; physical therapy; stroke; evidence-based practice; outcome measures.

INTRODUCTION

Stroke is a leading cause of physical disability (1) and an important health concern for individuals and society. An estimated 51% (2) of people lose the ability to walk on their own after stroke. Despite a rapid rate of motor recovery that commonly occurs in the first 5–6 weeks post-stroke (2), deficits can persist in the long-term and contribute to decreased participation in everyday activities and meaningful life pursuits (3). Not surprisingly, people who have experienced a stroke identify improvement in walking as a primary rehabilitation goal (4), and the majority of physical therapy time during in-patient stroke rehabilitation is spent on retraining walking ability (5).

Healthcare professionals can improve walking outcomes post-stroke through incorporation of evidence from high-quality research (6) related not only to treatment but also to assessment of walking limitation. Clinical practice guidelines for the delivery of adult stroke rehabilitation (7, 8) include evidence-informed recommendations for the use of standardized measures of walking capacity supporting the importance of this primary component of health service delivery.

A number of reliable and valid assessment tools have been designed to evaluate a specific aspect of walking ability. For example, the two-, six-, and twelve-minute walk tests (9) (2MWT, 6MWT, 12MWT, respectively) evaluate distance walked during a time-limited test, the 5-metre or 10-metre walk tests (9) are used to assess walking speed, the Functional Ambulation Classification (FAC) (10) was developed to evaluate the level of human assistance required to walk, and the Shuttle Test was designed to capture exercise tolerance (9). There are also performance-based and self-report outcome measures that include select items designed to evaluate walking ability. Some of these measures were developed specifically for stroke, including the Chedoke-McMaster Stroke Assessment (9) (CMSA), the Motor Assessment Scale (9) (MAS), and the Stroke Rehabilitation Assessment of Movement (9) (STREAM), while others, such as the Barthel Index (9), the Clinical Outcome Variables Scale (9) (COVS), the Functional Independence Measure (9) (FIM), and the Rivermead Mobility Test (11) (RMI), have been tested in neurological populations including stroke.

Outcome measures can be used for multiple clinical purposes. For several measures, such as the 6MWT and gait speed tests, scores have been obtained among healthy individuals (i.e. reference values) that enable quantification of the magnitude of walking deficit among people with stroke (12, 13). These same measures have also demonstrated the ability to detect change in the attribute measured over time, known as sensitivity to change (9, 14). Finally, community standards for the distance required to walk across parking lots and within stores, and the speed needed to walk across the street safely enable therapists who administer tests of walking distance and speed to evaluate the degree to which an individual can function in the home and community environment (15). Interpretation of

outcome measure ratings could not only inform clinical decisions related to planning treatment and setting goals, but also improve education of patients and families about the effects of stroke on walking and communication with stroke teams and colleagues at other institutions (16, 17).

Investigations of current physical therapy practice for assessment and treatment post-stroke have been undertaken in Canada (18, 19), but none have focused on walking. A cross-Canada survey revealed that rehabilitation professionals report low implementation rates of evidence-based assessment and treatment of unilateral spatial neglect (20), and client participation (19) post-stroke. Stevenson et al. (18) surveyed members of the Neurosciences Division of the Canadian Physiotherapy Association in 2001. In a clinical vignette describing "a woman with hemiparesis able to walk a few steps with assistance", only 49% of the 206 respondents indicated that they would use a standardized assessment tool to evaluate the effect of treatment. Only 19% included walking practice as part of the proposed treatment plan.

Van Peppen et al. (17) reported on a survey of 167 physical therapists in the Netherlands and determined that rates of "routine" use of each of the 7 outcome measures recommended in the Dutch Clinical Practice Guideline on Physiotherapy Management of Patients with Stroke ranged from 7% to 49%. Researchers identified setting-specific barriers to outcome measure use that included difficulty changing routines, time investment, and financial compensation.

Physical therapists are recommended core members of interdisciplinary rehabilitation teams (8) and they play a central role in the rehabilitation of walking post-stroke. Yet, physical therapists' use of reliable and valid assessment tools to evaluate different aspects of walking ability post-stroke, however, is largely unknown. There is also little information regarding the purpose for which physical therapists use objective measures of walking ability. Finally, determining setting-specific barriers to use will assist in developing setting-specific interventions to enhance uptake of recommended assessment tools in the rehabilitation of walking limitation post-stroke.

Thus, the objective of this study was to determine physical therapists' perceptions and use of standardized assessments of walking ability post-stroke. A secondary objective was to determine whether perceptions and use of specific assessment tools varies across practice settings.

METHODS

Overview of study design

A cross-sectional postal survey of physical therapists providing services to people with stroke was conducted in Ontario, Canada. The survey questionnaire was designed to evaluate physical therapists' attitudes, beliefs, and behaviours in the context of evidence-based practice (EBP). Some findings have been previously reported (21). This paper presents results specific to the assessment of walking ability. We followed a modified Dillman (22), 3-step mailing procedure to optimize response rate. Individuals were posted an initial questionnaire in May 2005 and sent a thank you/reminder postcard 3 weeks later. Non-respondents were posted a second questionnaire at the end of June 2005.

Participants and sampling

Physical therapists providing services to adults with stroke were targeted for this study. A mailing list of individuals who identified neurology as their area of practice was obtained from the College of Physiotherapists of Ontario, the provincial regulatory body. The first questionnaire item was used to screen eligibility by asking recipients to indicate whether they provided services to people with stroke. Those who did not were asked to leave the remaining items blank and to return the questionnaire in the envelope provided. Eligible individuals not interested in participating (i.e. refusals) were also instructed to return the questionnaire with the remaining items unanswered.

Questionnaire

Questionnaire items (Appendix SI; available from: http://jrm.medicaljournals.se/article/abstract/10.2340/16501977-0820) were designed to evaluate physical therapists' perceptions and use of standardized assessments of walking ability post-stroke. Items were designed to capture consistent use of specific standardized measures (item 2), the purpose for consistently using measures of walking ability and perceived barriers to use (items 8–11). "Consistent use" was operationally defined as use with more than 6 out of 10 clients. Additional items were used to evaluate perceived availability (item 3) and usefulness (items 4, 5) of standardized measures of walking ability. Two items were used to assess whether physical therapists desired recommendations in clinical practice guidelines regarding specific measures to use (item 6) and their perceptions of the availability of clinical practice guidelines (item 7).

Items were added to evaluate perceptions of a clinician's role (item 12) and willingness to collaborate (item 13) in research. Multiple items were used to evaluate sociodemographic and practice characteristics (21).

For each item, respondents were asked to either indicate their level of agreement with the item statement using a 5-point Likert scale ("strongly disagree", "disagree", "neutral", "agree", and "strongly agree") or to respond "yes"/"no"/"do not know". Three physical therapists working in acute care or rehabilitation hospital settings verified the readability and relevance of the questionnaire wording.

Statistical analysis

Item-level responses were summarized descriptively using frequencies and percentages. Barriers to using standardized assessment tools identified by 15% or more of respondents were reported. A χ^2 test was used to determine whether the percentage of physical therapists using select outcome measures varied across the 3 practice settings in which therapists most commonly worked: general hospital, rehabilitation centre, and private practice. The measures for this analysis included ones that were recommended (8) (i.e. CMSA, 6MWT, RMI), mandated for use in rehabilitation hospitals (23) (i.e. FIM) or direct measures of walking (gait speed tests, 2MWT). The rate of using outcome measures for a specific purpose was compared across settings in a similar manner. An alpha level of 0.05 was used to determine statistical significance.

The University of Toronto research ethics board approved the study protocol. Physical therapists who returned a completed questionnaire were considered to have provided consent to participate. Data were analysed using SAS version 9.1.

RESULTS

A total of 1155 physical therapists were posted a questionnaire and 705 individuals responded (response rate 61.0%). Of the responders, 334 (47.6%) met the eligibility criteria and 270 (80.8%) completed the questionnaire (64 people or 19.2% refused to participate). Thus, data from 270 physical therapists were analysed.

Table I presents the characteristics of respondents and of their practice. Respondents were on average 40 years of age (standard deviation (SD) = 10, range 23–68 years) and 11.2% were men. The most commonly cited highest level degree obtained was a bachelor's degree (76.9%) and 45.4% of respondents had more than 15 years of experience in clinical practice. The most frequently reported practice settings were an acute care hospital (39.6%), a rehabilitation hospital (16.0%) and private practice (10.5%). The majority of therapists (60.9%) worked in an urban area.

Standardized assessment of walking limitation

The percentage of respondents using the following outcome measures on a consistent basis was: CMSA (61.1%), FIM (45.2%), gait speed test (32.2%: 14.8% used the 10-m walk and 10% used the 5-m walk), 2MWT (26.3%), COVS (13.7%), and the 6MWT (11.1%). Out of 124 therapists reporting use of the CMSA, only 35 (28.2%) also reported using the 2MWT, which is required to complete the CMSA Activity Index. The rate of use of the MAS, the Barthel Index, and the 12MWT was 3.0%, 2.6% and 1.5%, respectively. Only two respondents indicated use of the FAC, the STREAM or the Shuttle Test, and none of the respondents reported using the RMI. In the *Other* category, respondents most frequently listed the Berg Balance Scale (9) (20.0%) and the Timed "Up and Go" test (9) (11.1%).

Table II presents the rate of use of the CMSA, gait speed tests, 2MWT, 6MWT and the FIM by a subsample of 177 respondents across 3 practice settings. Consistent use of the CMSA, gait speed tests, the 2MWT and the FIM varied significantly by practice setting ($p \leq 0.05$). With the exception of gait speed, the highest rate of use was observed among physical therapists working in rehabilitation hospitals.

Purpose of standardized assessment of walking limitation

The percentage of respondents reporting consistent use of outcome measures to evaluate or to monitor change in walking ability was 44.6% and 42.9%, respectively. The percentage of respondents indicating that they used outcomes measure scores to determine prognosis for walking recovery, or readiness for discharge home or from therapy was 19.4% and 28.4%, respectively.

Table I. *Characteristics of respondents and their practice*

Characteristics	n	(%)
Age, years		
20–29	40	(14.9)
30–39	93	(34.7)
40–49	75	(28.0)
>50	60	(22.4)
Sex		
Female	239	(88.8)
Male	30	(11.2)
Highest degree		
Certificate/Diploma	30	(11.4)
Bachelors	203	(76.9)
Professional Masters	8	(3.0)
Applied or Research Master's	23	(8.7)
Years practiced		
<5	40	(14.9)
5–10	59	(21.9)
11–15	48	(17.8)
>15	122	(45.4)
Hours of work per week		
<20	28	(10.4)
20–30	51	(19.0)
31–40	154	(57.5)
>40	35	(13.1)
Practice location		
Urban	159	(60.9)
Suburban	52	(19.9)
Rural	50	(19.2)
Type of facility		
Acute care hospital	106	(39.6)
Rehabilitation hospital	43	(16.0)
Private practice/clinic	28	(10.5)
Home visiting agency	17	(6.3)
Long-term care facility	13	(4.9)
Other	61	(22.8)
Teaching institution[a]	181	(67.3)

[a]Defined as an institution that provides student therapists with clinical internships.

Table II. *Self-reported outcome measure use across practice settings*

Outcome measure	Acute care hospital (n=106) n (%)	Rehabilitation hospital (n=43) n (%)	Private practice (n=28) n (%)
Chedoke McMaster Stroke Assessment*			
Yes	74 (69.8)	36 (83.7)	14 (50.0)
No	32 (30.2)	7 (16.3)	14 (50.0)
Gait Speed**			
Yes	21 (19.8)	17 (39.5)	15 (53.6)
No	85 (80.2)	26 (60.5)	13 (46.4)
Two-Minute Walk Test**			
Yes	17 (16.0)	23 (53.5)	8 (28.6)
No	89 (84.0)	20 (46.5)	20 (71.4)
Six-Minute Walk Test			
Yes	11 (10.4)	9 (20.9)	5 (17.9)
No	95 (89.6)	34 (79.1)	23 (82.1)
Functional Independence Measure*			
Yes	55 (51.9)	28 (65.1)	8 (28.6)
No	51 (48.1)	15 (34.9)	20 (71.4)

*$p \leq 0.05$; **$p \leq 0.001$.

Table III. *Purpose of self-reported outcome measure use across practice settings*

Purpose of outcome measure use	Acute care hospital (*n*=106) *n* (%)	Rehabilitation hospital (*n*=43) *n* (%)	Private practice (*n*=28) *n* (%)
Evaluate walking ability**			
Yes	35 (33.0)	32 (74.4)	15 (53.6)
No	71 (67.0)	11 (25.6)	13 (46.4)
Monitor change in walking ability**			
Yes	33 (32.0)	30 (69.8)	15 (53.6)
No	70 (68.0)	13 (30.2)	13 (46.4)
Determine prognosis for walking recovery*			
Yes	15 (14.6)	14 (33.3)	8 (29.6)
No	88 (85.4)	28 (66.7)	19 (70.4)
Determine readiness for discharge			
Yes	30 (29.1)	19 (45.2)	8 (30.8)
No	73 (70.9)	23 (54.8)	18 (69.2)

*$p \leq 0.05$; **$p \leq 0.001$.
Frequencies do not sum to column total in some cases due to missing data.

Table III presents the rate of outcome measure use for different purposes in a subsample of 177 respondents across 3 practice settings. The rate of outcome measure use for different purposes varied significantly by practice setting ($p \leq 0.05$) with the exception of use to determine readiness for discharge. Use of outcome measures for different purposes was consistently highest among respondents working in rehabilitation hospitals.
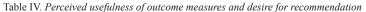
Factors influencing standardized assessment of walking limitation

The percentage of respondents who indicated yes, no, or don't know in response to the statement "Valid and reliable measures are available for the evaluation of walking ability post-stroke" was 59.9%, 12.0% and 28.1%, respectively.

Respondents who did not consistently use outcome measures to evaluate walking ability (*n*=149) cited a lack of time (28.1%), lack of knowledge about outcome measures (25.6%), the belief that outcome measures do not meet their clients' needs (23.3%), the belief that outcome measures are too difficult to administer in the work setting (21.1%), and a lack of consensus about which measures to use (17.0%) as barriers to use. Among respondents who did not consistently use outcome measures to monitor change in walking capacity (*n*=152), barriers included a lack of time (30.7%), lack of sensitivity to change of outcome measures (20.7%), low priority (17.8%), and lack of available measures (15.2%). Respondents who did not consistently use outcome measures to determine prognosis for walking recovery (*n*=212) cited a lack of clear evidence (36.7%), lack of time (35.2%) and low priority (23.0%) as barriers to use for this purpose. Finally, therapists who did not consistently use outcome measures to determine readiness for discharge (*n*=187) indicated the belief that available measures do not reflect the home or community environment (38.2%), a lack of time (20.4%) and a lack of normative values (15.9%) as barriers to use for this purpose.

Table IV presents respondents' perceptions of the usefulness of outcome measures and the desire for recommendations on outcome measure selection. As many as 80.5% of respondents agreed or strongly agreed that clinical practice guidelines for stroke rehabilitation should recommend specific measures to use to evaluate and monitor walking ability post-stroke. The percentage of respondents who answered yes, no or do not know to the statement "Clinical practice guidelines are available for walking rehabilitation post-stroke" was 15.3%, 23.7% and 61.0%, respectively.

As many as 88.0% of respondents agreed or strongly agreed that input from clinicians in the development of research projects would enhance the applicability of walking rehabilitation research to clinical practice. More than half of respondents (55.5%) affirmed they would be willing to work periodically with researchers to provide clinical input in the development of research questions (24.6% responded "no" and 19.9% responded "do not know").

Table IV. *Perceived usefulness of outcome measures and desire for recommendation*

Statement	*n*	Response (%)				
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Existing measures of walking capacity are useful for quantifying the severity of walking deficit	264	1.5	18.9	38.3	38.6	2.7
Existing measures are appropriate for the evaluation of walking capacity in patients with mild, moderate and severe deficits	265	1.9	30.2	35.9	30.6	1.5
Clinical practice guidelines for stroke rehabilitation should recommend specific measures to use to evaluate and monitor walking ability post-stroke	266	1.9	6.4	11.3	67.3	13.2

DISCUSSION

This study evaluated physical therapists' perceptions and use of standardized assessments of walking ability post-stroke. It also examined the use of assessment tools across practice settings.

In terms of consistent use of specific outcome measures (i.e. use with > 6/10 patients), we observed a moderate rate of use of the CMSA and the FIM, a low rate of use of gait speed tests, the 2MWT, the 6MWT, and the COVS, and negligible use of the remaining measures listed in this questionnaire item (Appendix SI, item 2).

The CMSA is a two-part measure consisting of an Impairment Inventory and an Activity Inventory. Use of the CMSA in the current study appears primarily to reflect use of the Impairment Inventory given that only a quarter of CMSA users also reported using the 2MWT required to complete the Activity Inventory. It is also possible that some respondents did not link use of the CMSA with use of the 2MWT when they completed the survey, which would have led to an underestimation of the rate of 2MWT use. Rehabilitation professionals rely heavily on what they learned during professional training when selecting treatment interventions (24), and learn about new research from trainees (25). Thus, it is likely that the moderate use of the CMSA was promoted by the development of this scale in Ontario where our study was conducted, teaching of the CMSA as part of the neurological physical therapy curriculum at Ontario universities, and students' influence on practice during clinical internships.

The moderate rate of FIM use, with the highest rate observed in rehabilitation hospitals (65.1%), was not surprising, given that the Ontario Ministry of Health and Long-Term Care began mandating quarterly reporting of FIM scores among rehabilitation hospitals to the Canadian Institute of Health Information as part of the Canadian National Rehabilitation Reporting System in 2002 (23). A mandate can be an effective strategy for securing high rates of implementation of outcome measures (26), but such a strategy does not ensure that the measure is being used to improve clinical decision-making and the quality of healthcare services provided.

The low rate of use of gait speed tests and of the 6MWT is surprising given the strong evidence of reliability and validity, sensitivity to change (9), existence of normative values (12), and relevance to standards for community mobility (15). These measures are also quick and easy to administer and require little training or equipment. The rate of consistent use of gait speed tests observed in one-third of respondents in the current study is lower than the rate of physical therapists' self-reported use of the 10-m walk test in stroke management in the Netherlands (44%), where this test is recommended in the Dutch Clinical Practice Guideline on Physiotherapy Management of Patients with Stroke (7).

Results of the current study show that therapists most commonly use standardized assessment tools on initial evaluation or to monitor change in walking ability, but less than half of respondents reported implementing these practices on a consistent basis. Furthermore, findings indicate that few therapists (approximately one-fifth) engage in formulating a prognosis of walking recovery and only a quarter of therapists consider scores from walking assessments when determining readiness for discharge home or from therapy. The barriers to use of standardized assessments of walking limitation identified in the current study may explain these findings and inform intervention development to promote use.

A primary and modifiable barrier to the use of standardized assessments of walking limitation observed in this study was lack of knowledge. Forty percent of respondents were not aware or were unsure that valid and reliable measures are available for the evaluation of walking ability post-stroke. This lack of awareness could be improved through a knowledge translation intervention.

Therapists also consistently noted that time to administer and re-administer standardized assessment tools is lacking. Insufficient time is cited as the top barrier to EBP across healthcare professional groups (21, 27, 28). In qualitative studies, rehabilitation professionals have explained that time spent administering outcome measures (29) or searching or reviewing the research literature (25) is at the expense of patient care. Managerial and/or professional practice leaders in organizations are well positioned to reinforce the importance of assessment so that therapists feel supported to take time during patient encounters to implement best practice recommendations related to this practice. Use of benchmarks and audit and feedback may be helpful strategies to improve and sustain recommended assessment practices (30, 31).

Our study findings demonstrate that barriers to standardized assessment of walking limitation go beyond lack of awareness of assessment tools or insufficient time. Some barriers, such as perceptions that standardized assessment tools lack sensitivity to change or prognostic value, can be addressed by synthesizing existing literature that shows otherwise. For example, Salbach et al. (14) demonstrated how the sensitivity to change of a number of physical therapy assessment tools varies according to the degree of walking limitation in the first 5 weeks post-stroke. A number of studies have revealed predictors of walking recovery after stroke (32, 33). Other barriers that related to perceived relevance, usefulness or appropriateness of administering standardized assessment tools may be more difficult to address. Further investigation of the barriers to use of specific assessment tools is needed to inform the development of knowledge translation interventions designed to increase their uptake into clinical practice.

In another qualitative study (29), physical therapists in neurological practice described how they preferred information or "informal" evidence that they derived from the client, their clinical knowledge, and their intuition to information derived from outcome measures because they trusted informal evidence to a greater extent and it was immediate and obvious. Outcome measures were used out of a sense of professional obligation, for communication purposes to validate their work, justify their services, and standardize their practice, but not for clinical decision-making. Until the relevance of standardized assessment tools for clinical decision-making is realized, we may continue to observe lower than desired rates of use.

Therapists clearly desired recommendations in clinical practice guidelines on which standardized measures of walking to use. Approximately 85% of participants, however, were unaware that stroke rehabilitation guidelines were available. Although clinical practice guidelines that recommended providing a baseline assessment of function (including gait and locomotion) and included a list of standardized assessment tools were available at the time of the survey (6), Canadian best practice recommendations for stroke were not published until after this survey was completed.

Use of measures along the continuum of care

The study results indicated that the rate of therapists' use of standardized assessment tools varies across 3 practice settings, general hospital, rehabilitation hospital and private practice settings, with the highest rates observed in the rehabilitation setting. These results should be interpreted with caution, as the small number of participants employed in rehabilitation hospitals or in private practice in the current study limits the generalizability of findings regarding those settings. Despite this limitation, it is important to examine rates of assessment practice across settings along the continuum of care. Outcome measure use provides a common language for communicating information about patient status among rehabilitation professionals when the same measures are used across the continuum of care. Although use of the CMSA was high in acute care (69.8%) and rehabilitation settings (83.7%), use of the 6MWT was limited in any setting, and the RMI was not used at all. This pattern of use across settings mirrors findings observed by van Peppen et al. (17) and provides a baseline for comparing the effect of efforts within the Canadian stroke system to increase the rate of use of these recommended measures (8).

As many as 88.0% of participants agreed that input from clinicians in the development of research projects would enhance the application of walking rehabilitation research to clinical practice and just over half of respondents expressed a willingness to collaborate with researchers to provide clinical input in the development of research questions. Collaboration with frontline clinicians throughout the research process is considered important to optimize the clinical relevance of research. Clinical collaborators can become clinical champions of the research and directly assist in the translation of findings (34).

In addition to the limitations already discussed, it is uncertain whether observed rates of outcome measure use from this Ontario survey would generalize to other Canadian provinces that are at different stages of implementing a systematized approach to stroke care as part of the Canadian stroke strategy (35). Therapists' perceptions of the stroke research literature and patterns of outcome measure use are probably similar among other physical therapists in developed countries with similar socio-demographic characteristics as study participants. A strength of this study was that sampling was taken from the database of registered physical therapists of the provincial regulatory body, as it probably resulted in a more representative sample of therapists across the province of Ontario than the use of lists of members of professional associations.

In conclusion, physical therapists demonstrate a moderate rate of consistent use of standardized assessment tools for the evaluation of walking limitation post-stroke, with a preference for administering the CMSA or the FIM compared with functional walk tests such as the 2WMT, 6MWT and gait speed tests. Therapists use these tools primarily to evaluate or monitor change in walking ability, while few therapists use the literature or test results to formulate a prognosis for walking recovery or judge readiness for discharge. Different strategies will be required to address the multifaceted barriers to standardized assessment of walking ability post-stroke.

ACKNOWLEDGEMENT

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