Do Neglect Assessments Detect Neglect Differently?

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OBJECTIVE. We determined whether various assessment tools detect neglect differently by administering a battery of assessments to people with stroke.

METHOD. We conducted a case series study and administered five neglect assessments (paper-and-pencil, functional, virtual reality) to participants poststroke.

RESULTS. Twelve participants (6 men, 6 women) with stroke completed the assessment battery, which required approximately 2 hr to administer (over one to two sessions). All participants demonstrated neglect on three or more assessments. Functional assessments and the virtual reality assessment detected neglect more frequently than the paper-and-pencil assessments. Participants performed differently on the paper-and-pencil assessments and functional assessments.

CONCLUSION. Because neglect is complex, detection may depend largely on the assessment administered.

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Neglect is evidenced as a failure to attend or respond to stimuli on the side of the body or space contralateral to the lesioned hemisphere (Heilman, Valenstein, & Watson, 2000). It is a common poststroke disorder (Buxbaum et al., 2004) that occurs in as many as 82% of people with right-hemisphere lesions (Bowen, McKenna, & Tallis, 1999). Less commonly, it can affect those with left-hemisphere lesions (Bowen et al., 1999).

The different neglect subtypes are personal, peripersonal, and extrapersonal; survivors may demonstrate behaviors associated with one or more subtypes (Buxbaum et al., 2004). For example, a person may not be able to brush the left side of his or her hair (personal), demonstrate difficulty locating a toothbrush on the left side of the countertop (peripersonal), or bump into doorways or objects (extrapersonal). Neglect restricts independence in activities of daily living (ADLs; e.g., dressing) and instrumental activities of daily living (IADLs; e.g., cooking), and stroke survivors with neglect demonstrate greater disability compared with those without neglect (Buxbaum et al., 2004; Jehkonen, Laihosalo, & Kettunen, 2006).

Neglect is a complex and heterogeneous syndrome that is challenging to measure (Bonato, 2012; Bowen et al., 1999). No single gold-standard assessment exists (Bowen et al., 1999), but there are more than 60 measures that assess neglect (Menon & Korner-Bitensky, 2004). Many of these assessments measure body function impairment by observing a person's ability to perform paper-and-pencil tasks such as bisecting a line or locating visual stimuli on paper (i.e., bottom-up assessment). In contrast, other assessments measure activity or participation restriction by observing a person's ability to perform ADLs, such as grooming (i.e., top-down assessment). The majority of these assessments are also static assessments (Toglia & Cermak, 2009). Technological advancements have led to use of virtual-reality computer-based assessments (Ogourtsova, Souza Silva, Archambault, & Lamontagne, 2015).

Therapists and researchers have been encouraged to use a battery of assessments to comprehensively assess neglect (Azouvi et al., 2002; Bailey, Riddoch, & Crome, 2000; Beis et al., 2004; Buxbaum et al., 2004; Jehkonen et al., 2006; Lindell et al., 2007; Luukkainen-Markkula, Tarkka, Pitkanen, Sivenius, & Hamalainen, 2011; Plummer, Morris, & Dunai, 2003). However, stroke rehabilitation therapists do not routinely assess people for neglect (Menon-Nair, Korner-Bitensky, Wood-Dauphinee, & Robertson, 2006; Petzold et al., 2014). Therapists report several barriers that hinder their use of neglect assessments, including a lack of time to administer assessments and limited knowledge of how to choose the best neglect assessment (Petzold et al., 2014).

Currently, no clinical practice guidelines exist to help therapists or researchers select neglect assessment tools. One reason for the absence of such guidelines is uncertainty regarding the measurement properties of the various assessments when used as an assessment battery or how well the assessments work together to measure neglect. For example, stroke survivors may demonstrate impairments on a line bisection test but no impairments on a star cancellation test, or vice versa (Azouvi et al., 2002, 2006; Bailey et al., 2000; Beis et al., 2004). Similarly, survivors may not demonstrate impairment on a paper-and-pencil test but will when a single functional assessment, a few items from several functional assessments, or a virtual-reality assessment are administered (Azouvi et al., 2002, 2006; Buxbaum, Dawson, & Linsley, 2012; Buxbaum et al., 2004). These findings call into question the construct validity of an assessment battery. Depending on the test selected, neglect may or may not be detected.

The tenet that functional assessments may be more sensitive to neglect than paper-and-pencil assessments has support (Azouvi et al., 2006; Blini et al., 2016; Pedrolì, Serino, Cipresso, Pallavicini, & Riva, 2015). Functional tasks require a person to pay attention to objects placed near the body (personal), around the body (peripersonal), and away from the body (extrapersonal). The high task demands associated with performance of functional assessments may also tax a person's cognitive reserve more than paper-and-pencil assessments (Bonato, 2012). However, whether different functional assessments, comprising items having different types of task demands, identify people with neglect in the same manner is unclear.

Clearly, a need exists to improve outcomes for people with neglect; however, the development of optimal rehabilitative interventions requires adequate measurement tools and improved integration of assessments into routine rehabilitation practice. Not adequately measuring neglect results in not adequately addressing it in the rehabilitation program. Our long-term goal is to identify a thorough yet

expeditious and clinically useful neglect measurement method. This study is an initial step toward that goal.

Here, we address the question, "Do various assessment tools detect neglect differently?" In other words, in this proof-of-concept study, we sought to gain a better understanding of how different tools relate to each other with regard to the detection of, or failure to detect, neglect in a small sample of stroke survivors. To our knowledge, this study is the first to directly compare within-subject performance on an extensive array of paper-and-pencil, functional, and virtual-reality neglect assessments. The findings will provide initial conceptual support and direction for future studies aimed at designing a framework to support the occupational therapy clinical reasoning process for selecting a neglect assessment to use in practice.

Method

This proof-of-concept case series is part of an ongoing cross-sectional study to improve measurement of post-stroke neglect. Procedures were approved by local institutional review boards, and all procedures were followed in accordance with the ethical standards of these institutions and the revised Declaration of Helsinki.

For the parent study, participants were eligible to participate if they were ≥ 18 yr old and had an ischemic or hemorrhagic stroke. Participants were excluded if they were unable to follow two-step directions or if they had any other neurological disease that might impair their vision or perception. All participants provided informed consent, and the researchers followed procedures to maintain participant confidentiality and protect the security of data. Participants either were recruited through a university stroke research registry or were referred by rehabilitation therapists who worked at a local rehabilitation hospital. More important, all participants were referred to the study because the stroke survivor, caregiver, or a therapist observed and documented behaviors consistent with neglect.

The first 12 participants enrolled in the parent study were included in this case series. The descriptive, paper-and-pencil, functional, and virtual-reality assessments (described next) were administered in a standardized manner by a single trained evaluator, a licensed and experienced occupational therapist. The order in which the assessments were administered was the same for all participants—that is, it was not randomized—because of testing procedure logistics. The assessments were administered in one to two sessions according to the participants' availability (i.e., inpatient schedule). The testing session occurred either in an outpatient laboratory setting or on the inpatient stroke rehabilitation unit of a local hospital.

Descriptive Assessments

Participants were interviewed to obtain demographic and medical history related to stroke. The National Institutes of Health Stroke Scale (NIHSS; Adams et al., 1999) was administered to determine participants' stroke severity. The NIHSS includes 13 items, and each item has specific scoring criteria. Item ratings are summed and reported out of 42 points, with higher scores indicating greater stroke severity. The NIHSS visual field item (Item 3) was used to determine the presence of hemianopsia. Neglect and hemianopsia frequently co-occur, and hemianopsia can exacerbate neglect (Cassidy, Bruce, Lewis, & Gray, 1999).

The Montreal Cognitive Assessment (MoCA) was administered to determine participants' cognitive impairment (Nasreddine et al., 2005) because cognitive impairment frequently co-occurs with neglect and is associated with more severe neglect (Linden, Samuelsson, Skoog, & Blomstrand, 2005). The MoCA includes 16 items that assess attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation (Chiti & Pantoni, 2014; Cumming, Churilov, Linden, & Bernhardt, 2013; Nasreddine et al., 2005; Toglia, Fitzgerald, O'Dell, Mastrogiiovanni, & Lin, 2011). Each item has specific scoring criteria. Item ratings are summed and reported out of 30 points, and scores <26 indicate cognitive impairment (Nasreddine et al., 2005).

Paper-and-Pencil Neglect Assessments

Two paper-and-pencil tests were administered. The Star Cancellation and the Line Bisection Tests, both of which are Behavioral Inattention Test conventional subtests (BIT-cs; Wilson, Cockburn, & Halligan, 1987), were selected because they demonstrate greater sensitivity to detecting neglect than other paper-and-pencil tests (Bailey et al., 2000). Each test was placed on a table at the participant's midline.

For the Star Cancellation Test, the participant was instructed to visually search an array of figures containing 54 small stars, 52 large stars, 13 letters, and 10 words to locate and cross out the small stars. The score was derived by adding the total number of small stars identified. Scores ≤51 indicate the presence of neglect (Wilson et al., 1987). For the Line Bisection Test, the participant was asked to use a pencil to mark the midpoint of three different lines on the page. Scores were derived using a template indicating how far away the mark was placed relative to the midline. Scores ≤7 indicate neglect (Wilson et al., 1987). It takes <5 min to administer and score these tests.

Functional Neglect Assessments

Three functional neglect assessments were administered: the Catherine Bergego Scale (CBS), Behavioral Inattention

Test behavioral subtests (BIT-bs), and Naturalistic Action Test (NAT). The CBS (Azouvi et al., 1996, 2003) contains 10 items (such as eating), each rated on a 4-point scale ranging from 0 (*no neglect*) to 3 (*severe neglect*). Item ratings are summed and reported out of 30 points; higher scores indicate greater activity limitation (Azouvi et al., 1996). The CBS was selected because it includes items that measure personal, peripersonal, and extrapersonal neglect (Table 1). Scores ≥1 indicate neglect. On average, it takes 25 min to administer and score the CBS.

The BIT-bs (Halligan, Marshall, & Wade, 1989; Hartman-Maeir & Katz, 1995) contains nine items (such as menu reading), each rated on a 10-point scale ranging from 0 to 9. Item ratings are summed and reported out of 81 points; lower scores indicate greater limitations. BIT-bs scores ≤67 indicate neglect (Wilson et al., 1987). The BIT-bs, which assesses peripersonal neglect, was selected because it is one of the most commonly used neglect assessments (Hartman-Maeir & Katz, 1995;

Table 1. Specification Matrix

Measure	Personal	Peripersonal	Extrapersonal
BIT-cs			
Star cancellation		X	
Line bisection		X	
BIT-bs			
Picture scanning		X	
Telephone dialing		X	
Menu reading		X	
Article reading		X	
Telling/setting time		X	
Coin sorting		X	
Address/sentence copying		X	
Map navigation		X	
Card sorting		X	
NAT			
Simple meal prep		X	
Wrap present		X	
Pack lunchbox/schoolbag		X	
CBS			
Grooming	X		
Dressing	X		
Eating		X	
Cleaning mouth after meal	X		
Gaze		X	X
Limb awareness	X		
Auditory attention			X
Collisions			X
Navigation			X
Locating personal belongings		X	X
VRLAT			
			X

Note. An X indicates that the item assesses for the neglect subtype; BIT-bs = Behavioral Inattention Test behavioral subtests; BIT-cs = Behavioral Inattention Test conventional subtests; CBS = Catherine Bergego Scale; NAT = Naturalistic Action Test; VRLAT = Virtual Reality Lateralized Attention Test.

Wilson et al., 1987). The BIT–bs takes approximately 30 min to administer.

The NAT (Schwartz, Segal, Veramonti, Ferraro, & Buxbaum, 2002) is unique because it contains three items (making coffee or toast, wrapping a present, and packing a schoolbag or lunchbox) that assess performance of complex IADLs. To determine the NAT Lateralized Attention Score (NAT–LAS), the assessor examined the total number of objects on the ipsilateral and contralateral sides that the participant used or touched to complete the task. The LAS is calculated by taking the proportion of objects used (total number of items used on one side divided by the total number of possible items on one side) on the contralateral side and subtracting the proportion of objects used on the ipsilateral side. An NAT–LAS score of 0.30 would indicate that the participant used 30% more ipsilateral than contralateral items. On the basis of Schwartz et al. (1999), we used a NAT–LAS cutoff score of 0.05 to indicate neglect. The NAT assesses peripersonal neglect and requires about 45 min to administer and score.

Virtual-Reality Neglect Assessment

We administered a computerized virtual-reality neglect assessment, the Virtual Reality Lateralized Attention Test (VRLAT; Buxbaum et al., 2012; Dawson, Buxbaum, & Rizzo, 2008). We selected the VRLAT because it has strong psychometric properties and because it requires very little equipment and can be administered and scored in a brief period of time (<5 min; Buxbaum et al., 2012; Dawson et al., 2008). The VRLAT predicts collisions during real-world navigation and has demonstrated greater sensitivity to neglect than paper-and-pencil tests (Buxbaum et al., 2012). Although the VRLAT assessment occurs in a virtual world, it assesses for extrapersonal neglect.

Participants travel down a virtual path and must identify target objects (statues, trees) on both the left and the right side of the screen. We used the Enhanced array of the VRLAT—which has distractor objects, auditory distractors, and moving distractors—because it is the most challenging. We chose to have the examiner navigate (examiner condition) the pathway using the joystick because some participants were unable to operate the joystick (Buxbaum et al., 2012).

The VRLAT was run on a PC laptop using a Logitech (Newark, CA) Extreme 3D Pro joystick. Participants were asked to name all of the trees and statues by attribute (e.g., color, category of animal). We used the following published scoring procedures: 0 points if an object was not identified; 1 point if the participant indicated an object; 2 points if the participant made a category or color error; and 3 points if participant correctly identified the object, including category and color (Buxbaum et al., 2012). Lower VRLAT scores indicate greater impairment, and a score $\leq 53/60$ indicates neglect (Buxbaum et al., 2012).

Analyses

Published cutoff scores for each assessment were used to indicate the presence or absence of neglect for each participant.

Results

Table 2 presents the participants’ characteristics. Participants were primarily male and between ages 52 and 79 yr. All participants were right handed and sustained a right hemispheric stroke. Participants were assessed between 9 and 2,463 days poststroke and demonstrated mild to severe stroke symptoms on the NIHSS (scores ranged from 3 to 20; Brott et al., 1989). Of the 12 participants, 11 demonstrated cognitive impairment on the MoCA

Table 2. Participant Characteristics

ID	Gender	Age, yr	Handedness	Lesion Side	Stroke Type	Time Since Stroke, days	NIHSS	MoCA	Hemianopsia
01	Female	63	R	R	Hemorrhagic	13	5	20	No
02	Male	71	R	R	Ischemic	16	20	21	Yes
03	Female	79	R	R	Ischemic	10	6	20	No
04	Female	52	R	R	Ischemic	307	6	25	No
05	Female	58	R	R	Ischemic	9	7	16	No
06	Male	67	R	R	Ischemic	11	3	18	No
07	Male	78	R	R	Ischemic	1,677	6	21	No
08	Male	65	R	R	Ischemic	249	11	20	No
09	Female	63	R	R	Hemorrhagic	1,149	4	28	No
10	Female	76	R	R	Hemorrhagic	17	4	22	No
11	Male	62	R	R	Hemorrhagic	2,463	9	22	No
12	Male	79	R	R	Ischemic	1,490	10	17	No

Note. MoCA = Montreal Cognitive Assessment; NIHSS = National Institutes of Health Stroke Scale; R = right.

(Cumming et al., 2013; Dong et al., 2010; Toglia et al., 2011). One participant (Participant 02) had hemianopsia.

Eleven participants completed the assessment battery in its entirety. One participant (Participant 10) completed all assessments except the NAT because of an unanticipated discharge from inpatient rehabilitation. On average, it took approximately 2 hr to administer the assessments. Inpatient participants (Participants 01, 02, 03, 05, 06, and 10) completed the assessments over the course of two sessions because of scheduling constraints (e.g., therapy schedule, nursing care, visitors). The other participants completed the assessments in a single session.

The 6 inpatient participants were referred by the rehabilitation therapists because they exhibited behaviors consistent with neglect during ADLs (e.g., dressing one side of the body) or ambulation (e.g., colliding with objects on the left). The 6 outpatient participants were referred because a therapist or caregiver noted participants' difficulties locating items placed on one side of the midline or trouble navigating through doorways.

The entire sample demonstrated neglect on three or more of the assessments, and 33% of the sample demonstrated neglect on all five assessments (Table 3). The participants for whom neglect was detected on all assessments also demonstrated the most severe impairments or limitations on all assessments. The Star Cancellation and Line Bisection Tests (BIT–cs) detected neglect in only 6 participants (50% of the sample), and the majority of those participants (66%) who demonstrated impairment were assessed during inpatient rehabilitation and were more acute (i.e., <6 mo poststroke). The CBS, NAT, and VRLAT detected neglect in all 12 participants (100% of the sample). However, the BIT–bs detected

neglect in only 6 participants (50% of the sample). Again, 66% of those participants who demonstrated impairment were assessed during inpatient rehabilitation. Participants 04, 06, 07, 09, and 11 did not demonstrate impairment on either the BIT–cs or the BIT–bs, but they did demonstrate impairment on all other measures. Participant 01 demonstrated impairment on all assessments except the paper-and-pencil BIT–cs. Participant 05 demonstrated impairment on all measures except the BIT–bs. The CBS, NAT, and VRLAT all identified 100% of participants as having neglect (Table 4). Participants' performance on the other assessments varied.

Discussion

The purpose of this study was to examine how different assessments detect neglect. We found differences in how the assessments classified participants (i.e., neglect, no neglect). Our findings coincide with those of previous studies and our expectations, indicating that some participants perform differently (i.e., no impairment) on paper-and-pencil assessments compared with functional assessments and virtual-reality assessments for neglect (i.e., demonstrate impairment; Azouvi et al., 2002, 2006). An interesting finding was that the two BIT–cs subtests classified participants in the same manner (i.e., neglect, no neglect), which differs from reports in the literature that have shown discrepancies in how paper-and-pencil tests classify people (Azouvi et al., 2002; Luukkainen-Markkula et al., 2011). Despite these findings, our data support the use of functional assessments and virtual-reality assessments over the use of paper-and-pencil-based assessments because they were better at detecting neglect.

Table 3. Performance on Neglect Battery

ID	BIT–cs		BIT–bs	CBS ^a	NAT Lateralized Attention Score ^a	VRLAT
	Star Cancellation Test	Line Bisection Test				
01	54	9	60 ^b	10 ^b	.27 ^b	30 ^b
02	38 ^b	0 ^b	40 ^b	23 ^b	.94 ^b	15 ^b
03	31 ^b	6 ^b	52 ^b	14 ^b	.49 ^b	9 ^b
04	54	8	76	11 ^b	.06 ^b	48 ^b
05	50 ^b	3 ^b	71	13 ^b	.45 ^b	45 ^b
06	53	9	77	9 ^b	.28 ^b	45 ^b
07	52	9	70	11 ^b	.23 ^b	23 ^b
08	46 ^b	3 ^b	47 ^b	18 ^b	.62 ^b	12 ^b
09	53	8	78	8 ^b	.22 ^b	48 ^b
10	32 ^b	2 ^b	15 ^b	20 ^b	—	12 ^b
11	52	9	75	9 ^b	.56 ^b	36 ^b
12	51 ^b	6 ^b	57 ^b	13 ^b	.58 ^b	12 ^b

Note. — = not applicable; BIT–bs = Behavioral Inattention Test behavioral subtests; BIT–cs = Behavioral Inattention Test conventional subtests; CBS = Catherine Bergego Scale; NAT = Naturalistic Action Test; VRLAT = Virtual Reality Lateralized Attention Test.

^aLower scores = better. ^bImpaired.

Table 4. Classification of Neglect by Assessment

ID	Paper-and-Pencil: BIT–cs	Functional: BIT–bs	Functional: CBS & NAT	Virtual Reality: VRLAT
01		X	X	X
02	X	X	X	X
03	X	X	X	X
04			X	X
05	X		X	X
06			X	X
07			X	X
08	X	X	X	X
09			X	X
10	X	X	X ^a	X
11			X	X
12	X	X	X	X
Total % of participants classified as having neglect	50.0	50.0	100.0	100.0

Note. An *X* indicates that assessment classified the participant as having neglect. BIT–bs = Behavioral Inattention Test behavioral subtests; BIT–cs = Behavioral Inattention Test conventional subtests; CBS = Catherine Bergego Scale; NAT = Naturalistic Action Test; VRLAT = Virtual Reality Lateralized Attention Test.

^aMissing data for NAT but impaired on CBS.

A unique contribution of our study was that we determined that discrepancies existed among the functional assessments with regard to identification of participants with neglect. We found that two functional assessments, the CBS and the NAT, detected neglect in all participants; the VRLAT also detected neglect in all participants. However, the BIT–bs and paper-and-pencil BIT–cs showed the greatest discrepancies in classifying people as having neglect. The BIT–bs and BIT–cs did identify 5 participants with neglect that the other assessments also classified as having neglect, but, on the basis of their performance on each assessment, these participants had more severe impairments. These findings suggest that the CBS, NAT, and VRLAT may be better at detecting mild neglect.

Differences in performance on the functional assessments are presumably because assessments measure different types of neglect. These findings may also be attributed to construct underrepresentation or construct-irrelevant variance of the assessments (Messick, 1993). For example, the CBS has items that assess for multiple types of neglect, whereas the items on the BIT–bs simply assess for peripersonal neglect (Plummer et al., 2003). The CBS may be better suited to more comprehensively assess people poststroke (Plummer et al., 2003). Nonetheless, it is important to note that the CBS contains a limited number of items that assess for these various types of neglect. Consideration of theoretical models (i.e., types of

neglect) may be useful to help guide neglect instrument development in the future.

Another reason for the difference in performance on the functional neglect measures is likely because the task demands vary greatly among the assessments. Task complexity can affect performance (Blini et al., 2016; Bonato, 2012). Tasks that involve multiple steps or require people to multitask may also be more sensitive to detecting neglect (Blini et al., 2016; Bonato, 2012), which may explain why the VRLAT and NAT detected that all participants had neglect. The VRLAT and NAT may be more sensitive at distinguishing people with mild neglect because of their complex demands (e.g., auditory and visual distractors, multiple steps).

It is critical that occupational therapy practitioners recognize that a single functional neglect assessment such as the BIT–bs may not identify people with neglect or comprehensively measure neglect. We recognize that it is not feasible for most practitioners to administer a large battery of assessments given time constraints and that a streamlined battery is needed. Practitioners must consider which functional assessment (CBS, NAT) or virtual-reality assessment (VRLAT) is the most comprehensive (i.e., assesses different types of neglect) yet practical to use in their own setting because each assessment's materials and administration time vary. For example, the VRLAT requires the use of a laptop computer and joystick but only takes 5 min to administer and score. The CBS and NAT take longer to administer (approximately 25–45 min) and require a greater number of materials than the VRLAT, but these items (e.g., shirt) are less expensive.

Although administration of these functional assessments in their entirety is impractical, it is likely that items from these assessments could be combined to measure neglect comprehensively. We are currently conducting a cross-sectional study to examine measurement of neglect using Rasch analysis. Rasch analysis provides a method to evaluate how well an assessment is able to measure a sample's ability and can help to identify a hierarchy of item difficulty to determine whether items duplicate one another. Thus, Rasch analysis can create a streamlined neglect assessment comprising items from different assessments.

The findings of this study must be interpreted with caution given the small sample size. In addition, we were unable to conduct sensitivity and specificity analyses given the small sample size. It is possible that some assessments inappropriately classified participants as having neglect who did not have neglect. However, we believe this is unlikely because rehabilitation therapists identified these participants as demonstrating behaviors consistent with neglect. We also used established cutoff scores when

available (except for the NAT–LAS score) to categorize participants. The NAT does not have a specific LAS cutoff score established to indicate neglect, but a score >0 would suggest bias to the ipsilateral side. We selected a conservative score (0.05) on the basis of previous studies (Schwartz et al., 1999). Future studies should be conducted to establish a LAS cutoff score for the NAT.

An experienced therapist monitored participants for fatigue and frequently offered rest breaks. However, it is possible that fatigue affected participants' performance on assessments that were administered later in the session. Although time since stroke may also have an impact on performance on different assessments, this sample showed no clear pattern of such an impact. Some participants whose symptoms were more chronic demonstrated greater impairment than those in the acute stage poststroke. Despite these limitations, our findings provide evidence needed to support further examination of functional and virtual-reality neglect assessments.

Implications for Occupational Therapy Practice

Given the prevalence of poststroke neglect, it is important that stroke rehabilitation therapists routinely administer neglect assessments. The results of this study have the following implications for occupational therapy practice:

- Occupational therapy practitioners must be cognizant of the limitations associated with administering a single neglect assessment.
- Practitioners should be aware that the BIT–bs and BIT–cs may not detect neglect.
- Practitioners should consider using a functional assessment that measures multiple types of neglect (e.g., CBS).
- Practitioners should consider which neglect assessment provides useful information that can be used to guide treatment.

Conclusion

Our study highlights how differently people perform on neglect assessments and emphasizes that detection of neglect may depend on the assessment administered. It is critical that additional studies be conducted to examine measurement of neglect and investigate and identify a practical and optimal method to assess neglect. A new instrument should be developed that combines items from existing assessments and also adds new items to more comprehensively measure neglect. Psychometric analysis and Rasch analysis of this instrument will be required before implementation in clinical practice. ▲

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