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Assessment of Unilateral Neglect

Unilateral neglect (ULN) (or “neglect”) is a common behavioral syndrome in patients following stroke. The reported incidence of ULN varies widely from 10%¹ to 82%² following right-hemisphere stroke and from 15%³ to 65%² following left-hemisphere stroke.

Reasons for the variability in the published rates of occurrence of ULN after stroke include subject selection criteria, lesion site, and the nature and timing of the assessment.⁴ The clinical impression that ULN occurs more frequently following right brain damage than left brain damage has been supported in a systematic review of published data.⁴ Unilateral neglect is characterized by the failure to report or respond to people or objects presented to the side opposite a brain lesion. If the failure to respond can be accounted for by either sensory or motor deficits, it is not considered to be neglect.⁵ Patients may have one type of neglect or a combination of neglect behaviors.⁶ Because ULN has a wide variety of clinical presentations, no single test can be used to identify the disorder in all patients, nor will a single test provide a comprehensive diagnosis of neglect behavior.⁷ Some authors^{7,8} have recommended that assessment of neglect include a test battery. To ensure sufficient sensitivity, the battery should include measures for all types of neglect.⁹

The purposes of this update are: (1) to clarify the different types of neglect, as a basis for understanding the tests and measures of ULN, (2) to review the validity and reliability of determinations of ULN, and (3) to make recommendations regarding the use of these tests by physical therapists. Given the scope of this article—which is an update of the assessment of neglect—only the major tests for ULN are discussed. For an extensive discussion of the pathophysiology and types of ULN, we refer readers to recent review articles on these topics.^{10,11}

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Types of Unilateral Neglect

There are 2 main classification systems for ULN. Unilateral neglect can be described in terms of the modality in which the behavior is elicited (sensory, motor, or representational) or by the distribution of the abnormal behavior (personal or spatial).¹²

Sensory neglect is defined as being unaware of sensory stimuli on the side of the body or space opposite the brain lesion.⁴ Sensory neglect can be further classified according to the modality in which it presents: visual neglect, auditory neglect, and tactile (somatosensory) neglect. A person can exhibit sensory neglect in one or more of these modalities. Sensory neglect is also referred to as “inattention,” “input neglect,” “attentional neglect,” and “perceptual neglect.”^{11,12}

Motor neglect is defined as the failure to generate a movement response to a stimulus even though the person is aware of the stimulus. The movement failure cannot be explained by a primary motor deficit or weakness.⁵ Motor neglect is also referred to as “output neglect” and “intentional neglect.”¹¹ Many types of motor neglect have been described.^{11,13–19} It can manifest as movement of reduced amplitude (hypometria), delayed movement initiation (hypokinesia), or unreasonable slowness in the execution of movement (bradykinesia). These disorders may occur in movements performed within the affected hemispace (eg, hemispacial hypometria) or in movements directed toward the affected hemispace (eg, directional hypometria).⁵ In this article, the term “hemispace” refers to one side of space,

Unilateral neglect is a common behavioral syndrome in patients following stroke.

as defined by the body midline. The disorders also can manifest in movements performed with the unaffected limb and in the unaffected hemispace.²⁰

Representational neglect is where a person ignores the contralesional half of internally generated images. Internally generated images are mental representations or visualizations of a task, action, or environment. One of the most notable demonstrations of representational neglect was by Bisiach and Luzzatti.²¹ Patients were asked to imagine and describe a familiar place. First, they were asked to describe the scene as though they were looking at the front of a cathedral from across a piazza. Then they were asked to imagine the scene from the opposite perspective, describing the piazza as though they were standing at the front doors of the cathedral. In both imagined views of the piazza, the patients omitted the left-side details in their description of the scene. The right-sided features of the scene described in the first instance were omitted (“neglected”) when they became left-sided features from the opposite perspective. Representational neglect is also referred to as “imagery neglect.”²²

Personal neglect is defined as a lack of exploration or awareness of the side of the body opposite the brain lesion.²³ Examples of personal neglect include failure to

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dress one half of the body or combing only one side of the head. Personal neglect is different from sensory neglect in that it refers to reduced awareness of the body or a limb itself, whereas sensory neglect refers to reduced awareness of sensory stimuli such as touch.

Spatial neglect is defined as a failure to acknowledge stimuli on the contralesional side of space²⁴ and can be further divided into peripersonal neglect and extrapersonal neglect.²⁵ *Peripersonal neglect* refers to neglect behaviors occurring within reaching space (near space). An example of peripersonal neglect is failure to eat the food on one half of a plate. *Extrapersonal neglect* refers to neglect behaviors occurring in far space. An example of extrapersonal neglect is inadvertently contacting obstacles such as a doorway when walking.

A single behavior can be classified by the means in which it is elicited and the distribution of the behavior (personal or spatial). For example, failure to cross out stimuli on the left side of a page in a cancellation task may be classified as visual neglect (if the omissions are due to unawareness of the visual stimuli) and as peripersonal neglect because the behavior manifests in reaching space. This behavior is sometimes called “visuo-spatial neglect.”⁷ The term “spatial neglect” is therefore relatively nonspecific, as it may comprise sensory (visual, auditory, somatosensory) or motor neglect. Nonetheless, it is important for physical therapists to assess the spatial distribution of the behavior because a person may demonstrate neglect in one domain of space but not another.^{23–25} For example, a patient may eat food from only one side of a plate (peripersonal space) but groom both sides of the body (personal space). We suggest that physical therapists be as specific as possible when diagnosing ULN and consider both the modality and the distribution to gain a comprehensive understanding of the nature of the neglect behavior.

Traditionally, the assessment of ULN in the clinical setting has involved the use of “pen-and-paper” tests such as line bisection, cancellation tasks, copying, and drawing.^{6,26} These tests are popular in clinical settings because they are simple and quick to administer. The Table summarizes the potential use and limitations of selected tests of ULN.

Line Bisection and Cancellation Tests

Line bisection tests require people to estimate and indicate the midpoint of a horizontal line presented on a piece of paper placed in front of them. The line is usually centered with respect to the patient’s midline, and a mark is made with a pencil in the preferred or unaffected hand. The test is typically scored by measuring the deviation of the bisection from the true center of the line. A deviation toward the side of the brain lesion

(unaffected side) is usually regarded as being indicative of neglect, although the magnitude of deviation can vary.^{27,28} There are many versions of the line bisection test, and the procedures are rarely standardized, except where the line bisection test is used as an item in a standardized test battery.²⁹

The line bisection test has construct validity for determining the presence of ULN³⁰ and moderate test-retest reliability.³¹ Construct validity of the line bisection test was reported by Marsh and Kersel,³⁰ who correlated performance on the line bisection test with the star cancellation test (Pearson $r = -.40$, $P = .02$) in a sample of 27 patients with a history of stroke in a rehabilitation unit. Moderate test-retest reliability for the line bisection test was reported (Pearson $r = .64$, $P < .001$, $n = 40$),³¹ even though patients with ULN are characteristically variable in their responses to line bisection tasks.³²

Cancellation tests require the person to search for and cross out target symbols presented on a page. Patients with ULN typically fail to cancel stimuli on the side of the page opposite the brain lesion. Many versions of the cancellation task exist. They include cancellation of shapes,^{33,34} stars,²⁹ numbers,³⁵ letters,³⁶ lines,³⁷ bells,³⁸ and circles.³⁹ Performance on cancellation tests varies according to the presence of distractor symbols, single or double target stimuli, and structured or unstructured stimulus arrays.^{34,40} Distractor symbols are non-target stimuli that must be ignored. The inclusion of distractors requires the person to decide whether a stimulus is a target before crossing it out (eg, bells cancellation test,³⁸ star cancellation test²⁹), rather than simply crossing out every stimulus on the page (eg, Albert test³⁷). Cancellation tests with distractors are more sensitive in detecting ULN than tests without distractors.^{1,8,38,41} Cancellation tests in which a person searches for 2 target symbols instead of a single cancellation stimulus are also thought to be more sensitive in eliciting ULN.^{40,42} However, very limited data are reported regarding the sensitivity and specificity of the various cancellation tests, and the psychometric properties of these tests of ULN remain poorly understood. The stimulus array in cancellation tests can be presented in a uniform fashion with the symbols neatly arranged in structured rows and columns, or in a random, unstructured manner. The former method has been shown to be associated with improved performance.^{34,40,43}

Cancellation tests, such as the star cancellation test and the bells cancellation test, have been shown to correlate with other clinical tests of ULN (Pearson $r = .26–.78$),^{30,44} indicating construct validity. Cancellation tests are believed to have greater test-retest reliability than the line bisection test³¹ and are often more sensitive for detecting ULN than line bisection tests.^{30,44} Some

Table.
Tests for Unilateral Neglect

Test	Comments for Use	Limitations
Line bisection tests	Include qualitative evaluation and task modification ^{50,51} (eg, response to verbal/visual cues, effect of hand used, effect of position of line relative to patient's midline)	Unable to differentiate between sensory and motor neglect ⁴⁶ Equivocal sensitivity ^{7,45} Sometimes unstandardized
Cancellation tests	Suggest that neglect behavior is observed on different types of cancellation tests (eg, \pm distractors, single or double target stimuli, structured and unstructured arrays) Include qualitative evaluation and task modification ^{50,51} (eg starting point, scanning pattern, search time, response to cues)	Unable to differentiate between sensory and motor neglect ⁴⁶
Copying and drawing tests	Not recommended for assessing unilateral neglect	Insensitive ⁵⁵ Difficult to interpret ^{7,8} Questionable validity ^{31,54-56} Unable to differentiate between sensory and motor neglect ⁴⁶
Behavioural Inattention Test (BIT) ²⁹	May be used in conjunction with tests for personal neglect and extrapersonal neglect Behavioral tests may be used to evaluate impact of neglect in visually based functional tasks	All tests performed in peripersonal space Requires fluency in English Unable to differentiate between sensory and motor neglect ⁴⁶ Time-consuming ^a
Semi-structured Scale for Functional Evaluation of Hemi-Inattention ^{60,61}	Can differentiate between personal and extrapersonal neglect May indicate severity of neglect in functional tasks	Personal scale requires validation Requires therapist to be trained in rating scale Extrapersonal scale does not differentiate between peripersonal and far space Unable to differentiate between sensory and motor neglect ⁴⁶
Catherine Bergego Scale (CBS) ⁴¹	Standardized checklist completed by treating therapist during observation of patient May be used to diagnose personal, peripersonal, and extrapersonal neglect Indicates severity and can be used to monitor changes in neglect behavior "Anosognosia score" can indicate patient's awareness of difficulties in everyday activities	Score does not differentiate between personal and spatial behaviors (although personal and spatial tasks are included) Unable to differentiate between sensory and motor neglect ⁴⁶ In severe cases, it may be difficult to determine whether problems are due to neglect or other factors (scoring alternatives are provided for such cases)

^a Cermak SA, Hausser J. The Behavioural Inattention Test for unilateral visual neglect: a critical review. *Physical and Occupational Therapy in Geriatrics*. 1989;7(3):43-53.

authors, however, have reported sensitivity of the line bisection test to be greater than⁴⁵ or equal to⁷ that of cancellation tests. Relative test sensitivity may be influenced by the type of cancellation test used.³¹

Despite their validity in detecting the presence of ULN, line bisection and cancellation tests cannot be used to differentiate between sensory neglect and motor neglect because they require both visual search and manual exploration.⁴⁶ For example, omission of contralesional targets in cancellation tests may be due to either a lack of awareness (visual neglect) or an inability to move toward the contralesional side (motor neglect), as motor neglect may affect the unaffected arm as well as the head or eyes or contralesional limb.^{5,46,47} Similarly, in line bisection tests, the rightward error observed in left ULN may be explained by an attentional bias (visual neglect) such that the person underestimates the extent of the

left end of the line and overestimates the right end.^{48,49} Alternatively, the rightward error may be due to difficulty moving in a leftward direction.¹⁷ Because line bisection and cancellation tests are performed within reaching space, these tests can indicate the presence of neglect in peripersonal space, but they cannot identify personal neglect or neglect in extrapersonal (far) space.

Refining Line Bisection and Cancellation Tests: Qualitative Evaluation and Task Modification

Some authors^{50,51} have suggested that "qualitative" or "dynamic" evaluation of line bisection and cancellation test performance may provide the clinician with a greater understanding of the neglect behavior than line bisection or cancellation tests alone. The term "qualitative" refers to descriptive information about the patient's behavior. In a qualitative assessment of unilateral neglect, the clinician observes the patient during the

task performance and focuses on how the person performs the task rather than simply recording the outcome.⁵⁰ For example, in a cancellation test, the therapist might assess where the patient commences the task (left, right, top, bottom), the scanning pattern (horizontal, vertical, unsystematic), and search time.

Scanning pattern may be recorded during cancellation tests by tracing the sequence in which the patient selects the target stimuli and numbering them on a replica of the test sheet.³⁸ At the conclusion of the test, the numbers on the examiner's sheet are joined in chronological order to reveal the visual scanning pattern. Alternately, the therapist can give the patient a different colored marker after every 10 cancellations and record the order in which the colored markers were used.⁵¹ This allows the therapist to map the order in which segments of the array were scanned. People without visual perceptual problems usually start searching on the left and progress in a systematic manner, vertically or horizontally.³⁸ By contrast, the search strategy of individuals with attentional deficits has been described as disorganized and unmethodical.^{38,51}

We believe that descriptive information such as starting point and scanning pattern may help the therapist to identify attentional problems that might otherwise remain undetected. For example, in a cancellation test, a patient may scan from right to left or in a disorganized manner, but still manage to cancel all of the targets. Assessment based only on the result of the test could lead the therapist to conclude that ULN is not present because the patient did not omit any stimuli. However, observation of the starting point and scanning pattern would reveal that the way in which the task was performed was atypical. From a rehabilitation perspective, these mild deficits are important to identify, as these patients have been found to have an increased accident risk.⁵²

A "dynamic"^{50,51} approach to assessment of ULN refers to modifying particular aspects of the assessment task in order to determine whether the patient's performance can be improved with the addition of cues or a modification to the task. In this way, "dynamic assessment" can be likened to a hypothetico-deductive method for assessing ULN, in which the clinician develops an evolving understanding of the neglect behavior by examining how the person's performance changes in response to the task parameters. For example, in a line bisection test, the task could be modified by placing a letter (visual "anchor" or "cue") at each end of the line to be bisected. The person would then be instructed to report any letters he or she sees prior to bisecting the line. Failure to detect the letter at the left end of the line would indicate a lack of awareness, suggesting that visual

neglect is a contributing factor to impaired line bisection performance. Identification of the left-end letter with no reduction in rightward bisection error relative to the standard line bisection test suggests that motor neglect is a more likely contributing factor, because neglect was demonstrated despite awareness of left-sided stimuli. This is one example of how an evaluation of the effects of visual and verbal cues enables better understanding of the factors contributing to the neglect behavior on conventional tests of ULN. The therapist also might assess the effect on performance of hand used (affected, unaffected) or the position of the line relative to the patient's midline (center, left, right).

We believe that such modifications of line bisection and cancellation tests cannot differentiate types of ULN with certainty, but can provide the clinician with useful information about the task conditions that influence the display of the symptoms. Our opinion is based on the assumption that task modification involves the therapist thinking about and hypothesizing possible reasons for the impaired performance. This thought process might encourage therapists to consider the type of neglect a person has, rather than merely identifying the presence of neglect on these pen-and-paper tests.

Copying and Drawing Tests

Copying simple figures and free drawing are frequently used by clinicians to detect ULN in patients following stroke. Figures typically used for copying include flowers, stars, cubes, and geometric shapes.^{3,53} Drawing from memory is considered to test for representational neglect.^{31,54} Test objects considered to be sensitive to detecting ULN are a clock face, the human form, and a butterfly.³ Incomplete drawing or copying with omissions or gross distortions on the contralesional side is considered indicative of ULN. In some situations, the person may confine the drawing to the unaffected side of the page.

Two problems with copying and drawing tests are: (1) subjectivity in the interpretation of the results⁵⁵ and (2) insensitivity for identifying patients with ULN.^{7,8} Not all patients with ULN perform abnormally on this type of test. Bailey et al⁷ found that relative to star cancellation and line bisection tests (for both tests, sensitivity=76.4%), the sensitivity of copying tests was poor (57.5%). In addition, these tests have questionable validity because impaired copying and drawing may reflect general cognitive impairment^{55,56} or constructional apraxia,^{31,54} as well as ULN. Although Kinsella and colleagues³¹ found substantial test-retest reliability for drawing from memory (Pearson $r=.86$, $P<.001$, $n=40$), they cautioned that the manifestation of neglect in any single drawing is highly variable. In view of the limitations of copying and drawing tests, Bailey et al⁷ do not

recommend the inclusion of copying a daisy and clock drawing in a test battery for ULN. Imagery-based tasks have been devised to detect representational neglect,^{22,57} although their validity remains to be determined.

The Behavioural Inattention Test

The Behavioural Inattention Test (BIT)²⁹ is a 15-item standardized test battery for assessing visual neglect, consisting of 6 of the most commonly used pen-and-paper tests (line crossing, letter cancellation, star cancellation, figure copying, line bisection, and free drawing), as well as 9 behavioral tasks (picture scanning, telephone dialing, menu reading, article reading, telling and setting the time, coin sorting, address and sentence copying, map navigation, and card sorting). Even though the BIT includes conventional tests that need to be interpreted by the therapist, such as drawing and copying, objectivity is enhanced by clearly defined marking criteria for rating the person's performance.²⁹ Marking is based on the number of omissions in each subtest, and a score is determined for each item. Individual test scores can be added for a total score on the conventional test component and the behavioral component. Data from control subjects have been obtained to determine cutoff scores for normal performance.²⁹

Construct validity of the BIT was examined by comparing the performance of 80 patients with unilateral brain damage on the behavioral items to performance on 6 conventional tests,²⁹ which were selected from previously published studies and considered valid measures of neglect.⁵⁸ There was a strong correlation between the conventional and behavioral test scores (Pearson $r=.92$, $P<.001$).²⁹ Ecological validity (the degree to which clinical tests relate to the patients' functioning in their everyday environment) of the BIT scores was examined by comparing the patients' scores on the behavioral tests with the therapist's responses to a short questionnaire completed at the time of assessment.³ Although the relationship was significant (Pearson $r=.67$, $P<.001$), the validity of data obtained with the questionnaire used to validate the BIT was not reported. Other researchers⁵⁹ found relationships (Spearman rho coefficients greater than .60) between 6 of the behavioral items from the BIT and actual performance on 5 compatible functional tasks (eg, using money from a purse, finding a telephone number in a personal telephone book, dialing a telephone number, telling time on a real watch, scanning objects in a room). We believe this finding further supports the ecological validity of the BIT. Interrater reliability (Pearson $r=.99$, $P<.001$, $n=13$) and test-retest reliability (Pearson $r=.99$, $P<.001$, $n=10$) of the BIT scores also have been examined.²⁹

Although the range of items comprising the BIT addresses the important issues of differing test sensitivity

(ie, ability to detect ULN) and diversity of clinical presentation of neglect,³ the BIT is limited to measuring neglect in peripersonal space.⁶ Thus, the BIT cannot identify personal neglect or extrapersonal (far) neglect. Furthermore, because the items of the BIT require both visual search and manual exploration, the BIT cannot distinguish between sensory (visual) neglect and motor neglect.⁴⁶ For these reasons, we believe that the BIT used in isolation does not adequately assess ULN. Nonetheless, the BIT is a useful test for measuring the impact of neglect on peripersonal tasks.

Semi-structured Scale for Functional Evaluation of Hemi-inattention

This scale comprises 2 subscales, one for personal neglect and one for (spatial) extrapersonal neglect.^{60,61} The patient is required to perform each task with real objects, rather than to simulate the activity. Personal tasks include hair combing, using a razor/makeup compact, and using eyeglasses. The extrapersonal tasks are serving tea, card dealing, picture description, and description of an environment. The patient receives a score of 0 to 3 for each item based on the symmetry of his or her performance and a total score for each subscale.

Both subscales were found to have high interrater reliability (Kendall tau = .88 for personal scales and .96 for extrapersonal scales, $P<.001$, $n=101$).⁶¹ The raters, however, underwent an intense training period prior to the investigation, which limits the generalizability of these findings. Concurrent validity was investigated by correlating performance of patients with neglect on the extrapersonal and personal scales with performance on 4 "standard diagnostic tests" (line cancellation test, letter cancellation test, Wundt-Jastrow Area Illusion Test, Sentence Reading Test). There were correlations between the extrapersonal scale and each conventional test (Kendall tau = -.60, $P<.001$; -.52, $P<.001$; .20, $P<.05$; and -.40, $P<.001$, respectively).⁶¹ Performance on the personal scale did not correlate with performance on the conventional tests (data not provided). According to the authors,⁶¹ the failure of the personal scale to correlate with conventional tests of ULN suggests that conventional and personal tests measure different dimensions of neglect. In our view, this finding reflects the importance of including both personal and extrapersonal tasks in any assessment of neglect behavior. The personal scale, however, requires further validation.

The Catherine Bergego Scale

The Catherine Bergego Scale (CBS)⁴¹ is a checklist for therapists designed to assess the presence and severity of ULN in a range of daily activities. The scale involves observing and evaluating the patient's function, rather than using test situations. The 10 checklist items are:

grooming and shaving the left part of the face, wearing the left sleeve or slipper, eating food on the left side of the plate, cleaning the left side of the mouth after eating, spontaneous leftward gaze orientation, “knowledge” of the left part of the body, auditory attention to stimuli from the left, collisions with objects on the left, leftward navigation in familiar places, and locating familiar items on the left. Although the items on the CBS are defined according to left ULN, the authors⁴¹ do not explicitly state that the CBS can be used only for left ULN. Presumably, “left” is replaced with “right” for people with left-hemisphere stroke displaying right ULN. To date, validation studies have been conducted only with patients with right-hemisphere stroke (ie, left ULN).^{41,62} Neglect behavior is rated by the observer on a 4-point scale: absent (0), mild (1), moderate (2), or severe (3). The average score for all rated items is multiplied by 10 to produce a total score ranging from 0 to 30. Items that are not possible to score due to severe hemiplegia, for example, are omitted from the total score.

The validity of the CBS as a measure of ULN was examined by correlating the total CBS score with performance of 5 tasks or tests associated with ULN (drawing, copying, reading, line cancellation test, bells cancellation test). All correlations were significant (Spearman $\rho = .50-.74$, $P < .001$), although some were relatively weak. A correlation also was found between the total CBS score and the Barthel Index (Spearman $\rho = -.63$, $P < .0001$).⁴¹ The CBS has been shown to have some interrater reliability (Spearman $\rho = .96$, $P < .0001$, $n = 18$).⁶³

An advantage of the CBS is that it includes personal, peripersonal, and extrapersonal items. Although the CBS does not differentiate personal and spatial neglect in the scoring of items, we believe that it is possible for the clinician to identify whether the person has spatial neglect or personal neglect (or both) by reviewing the score for individual items on the checklist. Indeed, in a recent study of the psychometric properties of the CBS, Azouvi et al⁶² suggested that items such as neglect in dressing and knowledge of the left limbs are related to personal neglect, whereas collisions while moving may be assumed to reflect an impairment of orienting of attention in extrapersonal space.

Another advantage of the CBS over other measures of ULN is its ability to provide a measure of the patient’s insight into their difficulties. A parallel form of the scale has been designed as a questionnaire,⁴¹ which the patient completes. The questionnaire allows a direct comparison of the therapist’s observation and the patient’s self-evaluation, providing an indication of the patient’s awareness of their everyday difficulties

(“anosognosia score”).⁴¹ This is the only measure of ULN that also considers anosognosia.

In our opinion, one limitation of the CBS is the difficulty differentiating whether sensory neglect or motor neglect contribute to the observed functional difficulties. Moreover, in patients with severe impairments, Azouvi et al⁴¹ acknowledged that it can be difficult to determine what is due to neglect and what is due to hemiplegia, sensory loss, or dressing apraxia. Scoring alternatives are described for situations where it is impossible to score an item.⁴¹ Despite these limitations, we believe that the CBS is a useful scale for measuring the functional impact of neglect in a range of everyday activities.

Conclusion

Conventional tests for ULN, such as line bisection and cancellation tests, are not necessarily suitable for differentiating between sensory neglect and motor neglect because they involve visual search and a manual response.⁴⁶ We believe, however, that these tests can provide the therapist with an indication of the presence of ULN, as well as a tool for evaluating how the patient responds to changes in task demands. This information may be useful for planning physical therapy interventions. In isolation, copying and drawing tests are not recommended for assessing ULN because they have a poor ability to discriminate between ULN, cognitive impairment,^{55,56} and constructional apraxia.^{31,54} Finally, this update has reviewed some of the tests available to measure the functional impact of ULN. Although none of the available functional tools can discriminate between sensory neglect and motor neglect, the CBS provides a way of distinguishing personal and spatial neglect, thereby yielding information that may be useful for the therapist in planning intervention and functional training.

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