

H. Clinical Assessment Tools

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71 Pages

Action Research Arm Test (ARAT)

Q1. What does the Action Research Arm Test test?

The ARAT is an observer-rated, performance-based assessment of upper extremity function and dexterity (Hsueh et al. 2002).

Q2. Describe the Action Research Arm Test

The ARAT has only 19 items, which are grouped into the following 4 subsets: grasp (6 items), rip (4 items), pinch (6 items) and gross movement (3 items). All items are rated on a 4-point ordinal scale ranging from 0 (no movement possible) to 3 (normal performance of the task). Within each subset, the first item is the most difficult and then ordered by ascending difficulty so that being able to achieve the first item implies subsequent easier tasks can be also be successfully completed.

Q3. Describe some of the key Action Research Arm Test numbers

Summation of scores yields a total score between 0 and 57.

Q4. What are the Advantages of the Action Research Arm Test?

Relatively short and simple measure of upper limb function.
No formal training is required.
Testing can be completed quickly on higher functioning patients

Q5. What are the Disadvantages of the Action Research Arm Test?

Good concurrent validity, although other forms of validity have not been evaluated within the stroke population.
Significant floor and ceiling effects have been identified (Van der Lee et al. 2002).
Unidimensional measure; hence, subset analyses should not be used independently but rather summated to provide a single overall score representing upper extremity function (Koh et al. 2006).

Action Research Arm Test (ARAT)

Questions	Answer
What does it measure?	Upper extremity function and dexterity (Hsueh et al. 2002).
What is the scale?	The ARAT consists of 19 items designed to assess four areas of function; grasp, rip, pinch, and gross movement. Each question is scored on an ordinal scale ranging from 0 (no movement) to 3 (normal performance of the task)
What are the key scores?	Scores range from 0 – 57, with lower scores indicating greater levels of impairment
What are its strengths?	Relatively short and simple measure of upper limb function. No formal training is required.

	Testing can be completed quickly on higher functioning patients
What are its limitations?	Good concurrent validity, although other forms of validity have not been evaluated within the stroke population. Significant floor and ceiling effects have been identified (Van der Lee et al. 2002). Unidimensional measure; hence, subset analyses should not be used independently but rather summated to provide a single overall score representing upper extremity function (Koh et al. 2006).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	+++ (TR) +++ (IO)	+	+++	++	++	+

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

Hsueh IP, Lee MM, Hsieh CL. The Action Research Arm Test: is it necessary for patients being tested to sit at a standardized table? *Clin Rehabil* 2002; 16:382-388.

Van der Lee JH, Roorda LD, Beckerman H, Lankhorst GJ, Bouter LM. Improving the Action Research Arm test: a unidimensional hierarchical scale. *Clin Rehabil* 2002; 16:646-653.

Koh CL, Hsueh IP, Wang WC, et al. Validation of the action research arm test using item response theory in patients after stroke. *J Rehabil Med* 2006; 38:375-380.

Barthel Index

Q1 What does the Barthel Index test?

The Barthel Index of Activities of Daily Living is an index of independence that is used to quantify the ability of a patient with a neuromuscular or musculoskeletal disorder to care for him/herself (regardless of particular diagnostic designations).

Q2. Describe the Barthel Index

The index consists of 10 common ADLs, 8 of which represent activities related to personal care while 2 are related to mobility. The BI can be completed through either direct observation or self-report.

Q3. Describe some of the key Barthel Index numbers

The index yields a total score out of 100 with higher scores indicating greater degrees of functional independence (McDowell & Newell 1996).

Q4. What are the Advantages of the Barthel Index?

Easy to administer and does not require formal training.
Takes little time to complete, which may reduce patient burden.
Widespread familiarity contributes to its interpretability.

Q5. What are the Disadvantages of the Barthel Index?

Relatively insensitive.
A lack of comprehensiveness may result in problems with ceiling/floor effects (Duncan et al. 1997).
Although many scoring cut-offs have been suggested, there remains a lack of consensus regarding the categorization of BI scores (Roberts & Counsell 1998).

Barthel Index

Questions	Answer
What does it measure?	The BI is an index of independence that is used to quantify the ability of a patient with a neuromuscular or musculoskeletal disorder to care for him/herself (regardless of particular diagnostic designations).
What is the scale?	The index consists of 10 common ADLs, 8 of which represent activities related to personal care while 2 are related to mobility.
What are the key scores?	The index yields a total score out of 100 with higher scores indicating greater degrees of functional independence (McDowell & Newell 1996).
What are its strengths?	Easy to administer and does not require formal training. Takes little time to complete, which may reduce patient burden. Widespread familiarity contributes to its interpretability.
What are its	Relatively insensitive.

limitations?	A lack of comprehensiveness may result in problems with ceiling/floor effects (Duncan et al. 1997). Although many scoring cut-offs have been suggested, there remains a lack of consensus regarding the categorization of BI scores (Roberts & Counsell 1998).
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References

McDowell I, Newell C. *Measuring Health. A Guide to Rating Scales and Questionnaires.*, 2nd ed. New York: Oxford University Press, 1996.

Duncan PW, Samsa G, Weinberger M, et al. *Health status of individuals with mild stroke. Stroke* 1997; 28:740-745.

Roberts L, Counsell R. *Assessment of clinical outcomes in acute stroke trials. Stroke* 1998; 28:986-991.

Beck Depression Inventory

Q1. What does the Beck Depression Inventory test?

The BDI was developed to identify the presence of depression as well as to provide a quantitative expression of its intensity (Beck et al. 1961).

Q2. Describe the Beck Depression Inventory

The BDI consists of 21 items found through clinical observation to be representative of the symptoms and attitudes associated with depression. The BDI follows a forced choice format in which respondents must choose one of four self-evaluative statements for each item in the inventory. These statements are graded in severity from 0-3.

Q3. Describe some of the key Beck Depression Inventory numbers

The BDI yields a total score ranging from 0-63 with higher scores indicating greater levels of depression. A score of 10 is generally accepted as indicating the presence of depression while score ranges of 10-18, 19-29, and 30-63 have commonly been used to classify mild, moderate, and severe depression, respectively (Aben et al. 2002, Beck et al. 1988).

Q4. What are the Advantages of the Beck Depression Inventory?

Short and simple measure of depression (McDowell & Newell 1996).

Does not require formal training to administer.

Does not heavily rely on the somatic symptoms of depression, making the BDI suitable for use with stroke patients (Aben et al. 2002).

Q5. What are the Disadvantages of the Beck Depression Inventory?

Although the standardized cutoff is optimal for use with stroke populations, it has been found to yield a high rate of misdiagnoses (approx. 31%) among stroke patients (Aben et al. 2002).

Some stroke patients have been reported to have difficulty with the BDIs forced choice format (House et al.1991).

Beck Depression Inventory

Questions	Answer
What does it measure?	The presence and intensity of depression (Beck et al. 1961).
What is the scale?	The BDI consists of 21 items that are representative of the symptoms and attitudes associated with depression. The BDI follows a forced choice format in which respondents must choose one of four self-evaluative statements for each item in the inventory.
What are the key scores?	The BDI yields a total score ranging from 0-63 with higher scores indicating greater levels of depression. A score of 10 is generally

	accepted as indicating the presence of depression while score ranges of 10-18, 19-29, and 30-63 have commonly been used to classify mild, moderate, and severe depression, respectively (Aben et al. 2002, Beck et al. 1988).
What are its strengths?	Short and simple measure of depression (McDowell & Newell 1996). Does not require formal training to administer. Does not heavily rely on the somatic symptoms of depression, making the BDI suitable for use with stroke patients (Aben et al. 2002).
What are its limitations?	Although the standardized cutoff is optimal for use with stroke populations, it has been found to yield a high rate of misdiagnoses (approx. 31%) among stroke patients (Aben et al. 2002). Some stroke patients may have difficulty with the BDIs forced choice format (House et al.1991).

Summary

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References

Beck AT, Ware CH, Mendelson M, Mock J, Erbaugh J. An inventory for measuring depression. *Archives of General Psychiatry* 1961; 4:561-571.

Aben I, Verhey F, Lousberg R, Lodder J, Honig A. Validity of the Beck Depression Inventory, Hospital Anxiety and Depression Scale, SCL-90 and Hamilton Depression Rating Scale as screening instruments for depression in stroke patients. *Psychosomatics* 2002;43: 386-393.

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McDowell I, Newell C. *Measuring Health. A Guide to Rating Scales and Questionnaires.*, 2nd ed. New York: Oxford University Press, 1996.

House A, Dennis M, Mogridge L, Warlow C, Hawton K, Jones L. Mood disorders in the year after first stroke. *The British Journal of Psychiatry* 1991; 158:83-92.

Behavioural Inattention Test (BIT)

Q1. What does the Behavioural Inattention Test test?

The BIT is a comprehensive battery designed to screen for unilateral visual neglect and to provide information relevant to its treatment (Halligan et al. 1991).

Q2. Describe the Behavioural Inattention Test

The BIT is divided into two major sections, each of which has its own set of subtests. The conventional section (BITC) is comprised of the following 6 subtests: line crossing, letter cancellation, star cancellation, figure and shape copying, line bisection, and representational drawing. The behavioural section (BITB) is comprised of the following 9 subtests: pre-scanning, phone dialing, menu reading, article reading, telling and setting the time, coin sorting, address and sentence copying, map navigation, and card sorting.

Q3. Describe some of the key Behavioural Inattention Test numbers

The BIT yields a total score out of 227 with higher scores indicating greater degrees of neglect. Cutoffs have been established for the total BIT as well as for each of the subsections such that a diagnosis of neglect is suggested if a patients' score exceeds the cutoff. The cutoff for the total BIT is 196 out of 227, 129 out of 146 for the BITC, and 67 out of 81 for the BITB (reported in Menon and Korner-Bitensky, 2004). Severity of neglect can also be calculated by adding the number of conventional tests on which the patient demonstrates neglect, with 6 indicating severe neglect and 1 indicating mild neglect.

Q4. What are the Advantages of the Behavioural Inattention Test?

The BIT is a comprehensive battery that provides a detailed and ecologically valid assessment of patient functioning (Halligan et al. 1991). A parallel form of the test is available, which allows for re-testing with minimal concern for practice effects. The behavioural subtests can be used to help therapists target tasks that should be given particular attention during treatment.

Q5. What are the Disadvantages of the Behavioural Inattention Test?

The BIT is both more time consuming and more expensive than most non-battery tests of neglect. Requiring 40 minutes for completion, the BIT is more taxing on patients than individual tests of neglect.

Behavioural Inattention Test

Questions	Answer
What does it measure?	Screens for unilateral visual neglect and provides information relevant to its treatment (Halligan et al. 1991).
What is the scale?	The BIT is divided into two major sections, each of which has its own set of subtests. The conventional section (BITC) is

	comprised of the following 6 subtests: line crossing, letter cancellation, star cancellation, figure and shape copying, line bisection, and representational drawing. The behavioural section (BITB) is comprised of the following 9 subtests: pre-scanning, phone dialing, menu reading, article reading, telling and setting the time, coin sorting, address and sentence copying, map navigation, and card sorting.
What are the key scores?	The BIT yields a total score out of 227 with higher scores indicating greater degrees of neglect. Cutoffs have been established for the total BIT as well as for each of the subsections with scores exceeding the cutoffs leading to a diagnosis of neglect. The cutoff for the total BIT is 196 out of 227, 129 out of 146 for the BITC, and 67 out of 81 for the BITB (reported in Menon and Korner-Bitensky, 2004).
What are its strengths?	The BIT is a comprehensive battery that provides a detailed and ecologically valid assessment of patient functioning (Halligan et al. 1991). A parallel form of the test is available, which allows for re-testing with minimal concern for practice effects. The behavioural subtests can be used to help therapists target tasks that should be given particular attention during treatment.
What are its limitations?	The BIT is both more time consuming and more expensive than most non-battery tests of neglect. Requiring 40 minutes for completion, the BIT is more taxing on patients than individual tests of neglect.

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References

Halligan P, Cockburn J, Wilson B. *The Behavioural Assessment of Visual Neglect. Neuropsychological Rehabilitation 1991; 1:5-32.*

Menon A, Korner-Bitensky N. *Evaluating unilateral spatial neglect post stroke: working your way through the maze of assessment choices. Top Stroke Rehabil 2004; 11:41-66*

The Berg Balance Scale

Q1. What is the Berg Balance Scale designed to test?

The Berg Balance Scale (BBS) provides a quantitative assessment of balance in older adults (Berg et al. 1989). It was intended for use in monitoring the clinical status of patients or effectiveness of treatment over time (Berg et al. 1995).

Q2. Describe the Berg Balance Scale

The BBS consists of 14 items requiring subjects to maintain positions or complete movement tasks of varying levels of difficulty.

Administration of the scale only requires a ruler, a stopwatch, chair, step or stool, room to turn 360 degrees and 10-15 minutes. It is administered via direct observation of task completion (Berg et al. 1995, Juneja et al. 1998).

Each of the 14 items receives a score of 0-4 based on the subject's ability to meet the specific time and distance requirements of the test. A score of 0 represents an inability to complete the item and a score of 4 represents the ability to complete the task independently.

Q3. What is the cut-off score for balance impairment?

Scores of less than 45 out of 56 are generally accepted as indicative of balance impairment (Berg et al. 1992a, Zwick et al. 2000).

Q4. What are the Advantages of the Berg Balance Scale?

The BBS measures a number of different aspects of balance, both static and dynamic. It does so with minimal space and equipment requirements (Whitney et al. 1998, Zwick et al. 2000).

No specialized training is required to administer the BBS.

High levels of reliability have been reported when the test was administered by untrained assessors.

The BBS is particularly well suited to acute stroke rehabilitation, as the majority of patients do not obtain maximum scores on admission to rehabilitation (Wee et al. 1999).

Q5. What are the Disadvantages of the Berg Balance Scale?

The BBS takes somewhat longer to administer than other balance measures (Whitney et al. 1998) and may not be suitable for the evaluation of active, elderly persons, as the item included are not sufficiently challenging for this group (Berg et al. 1989, Zwick et al. 2000). As no common standards for interpretation of BBS scores exist, their relationship to mobility status and the requirement for mobility aides (Wee et al. 2003).

The BBS may suffer from decreased sensitivity in early stages post-stroke among severely affected patients as the scale includes only one item relating to balance in the sitting position (Mao et al. 2002).

Berg Balance Score

Questions	Answer
What does it measure?	Quantitative assessment of balance in older adults (Berg et al. 1989).
What is the scale?	14 items requiring subjects to maintain positions or complete movement tasks of varying levels of difficulty. Items receive a score of 0-4 based on ability to meet the specific time and distance requirements of the test. 0 = inability to complete the item; 4 = ability to complete the test independently.
What are the key scores?	Maximum score = 56. A score of less than 45 is indicative of balance impairment (Berg et al. 1992a, Zwick et al. 2000).
What are its strengths?	Measures a number of different aspects of balance, both static and dynamic (Whitney et al. 1998). Requires little equipment or space and no specialized training. High levels of reliability even when test is administered by an untrained assessor. Particularly well suited to acute stroke rehabilitation, as the majority of patients do not obtain maximum scores on admission to rehabilitation (Wee et al. 1999).
What are its limitations?	Takes somewhat longer to administer than other balance measures (Whitney et al. 1998) and may not be suitable for the evaluation of active, elderly persons, as the item included are not sufficiently challenging for this group (Berg et al. 1989, Zwick et al. 2000). As no common standards for interpretation of BBS scores exist, their relationship to mobility status and the requirement for mobility aides (Wee et al. 2003). Decreased sensitivity in early stage post-stroke among severely affected patients as scale includes only one item relating to balance in the sitting position (Mao et al. 2002).

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References

Berg KO, Wood-Dauphinee S, Williams JL, Maki B. Measuring balance in the elderly: preliminary development of an instrument. *Physiotherapy Canada* 1989; 41:304-311.

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Whitney SL, Poole JL, Cass SP. A review of balance instruments for older adults. Am J Occup Ther 1998; 52:666-671.

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Wee JYM, Wong H, Palepu A. Validation of the Berg Balance Scale as a predictor of length of stay and discharge destination in stroke rehabilitation. Arch Phys Med Rehabil 2003; 84:731-735.

Mao HF, Hsueh IP, Tang PF, Sheu CF, Hsieh CL. Analysis and comparison of the psychometric properties of three balance measures for stroke patients. Stroke 2002; 33:1022-1027.

Box and Block Test

Q1. What does the Box and Block Test test?

The BBT is a performance based measure of gross manual dexterity (Mathiowetz et al. 1985).

Q2. Describe the Box and Block Test

150 small wooden blocks are placed in one of two equal compartments of a partitioned rectangular box. Respondents are seated and instructed to move as many blocks as possible, one at a time, from one compartment to the other in 60 seconds.

Q3. Describe some of the key Box and Block Test numbers

The BBT is scored by counting the number of blocks that are carried over the partition from one compartment to the other during the one-minute trial period. The patient's hand must cross over the partition in order for a point to be given, and blocks that drop or bounce out of the second compartment onto the floor are still rewarded with a point.

Q4. What are the Advantages of the Box and Block Test?

Quick and easy to administer.

The simplicity of the performance task and the seated administration position may make the test more accessible to a wider range of individuals.

Established age and gender-stratified norms increase the interpretability to the results.

Results may have utility as a prognostic indicator of physical health.

Q5. What are the Disadvantages of the Box and Block Test?

Noisy to administer and could be distracting to other patients (Mathiowetz et al. 1985).

Box and Block Test

Questions	Answer
What does it measure?	Performance based measure of gross manual dexterity.
What is the scale?	150 small wooden blocks are placed in one of two equal compartments of a partitioned rectangular box. Respondents are seated and instructed to move as many blocks as possible, one at a time, from one compartment to the other in 60 seconds.
What are the key scores?	The BBT is scored by counting the number of blocks that are carried over the partition from one compartment to the other during the one-minute trial period.
What are its strengths?	Quick and easy to administer. The simplicity of the performance task and the seated administration position may make the test more accessible to a wider range of individuals.

	Established age and gender-stratified norms increase the interpretability to the results. Results may have utility as a prognostic indicator of physical health.
What are its limitations?	Noisy to administer and could be distracting to other patients (Mathiowetz et al. 1985).

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References

Mathiowetz V, Volland G, Kashman N, Weber K. Adult Norms for the Box and Block Test of Manual Dexterity. *The American Journal of Occupational Therapy* 1985;39:386-391.

Canadian Neurological Scale (CNS)

Q1. What does the Canadian Neurological Scale test?

The CNS is a standardized neurological assessment of stroke patients that evaluates both mentation (level of consciousness, orientation and speech) and motor function (face, arm and leg).

Q2. Describe the Canadian Neurological Scale

Motor function evaluations are separated into sections A1 and A2, where A1 is administered if the patient is able to understand and follow instructions and A2 is administered in the presence of comprehension deficits (Cote et al. 1986, 1989). Each motor item is rated for severity and each rating is weighted "according to the relative importance of a particular neurologic deficit" (Cote et al. 1989).

Q3. Describe some of the key Canadian Neurological Scale numbers

Scores from each section are summed to provide a total score out of 11.5 with lower scores indicating greater levels of neurological deficit.

Q4. What are the Advantages of the Canadian Neurological Scale?

A short, simple assessment that does not need to be administered by a neurologist. The CNS can be used to monitor change and predict patient outcomes such as length of stay, death, and dependency.

Q5. What are the Disadvantages of the Canadian Neurological Scale?

The CNS is focused on limb weakness, neglecting other possible neurological impairments (Cuspineda et al. 2003).

Canadian Neurological Scale

Questions	Answer
What does it measure?	Neurological assessment of stroke patients that evaluates both mentation (level of consciousness, orientation and speech) and motor function (face, arm and leg).
What is the scale?	Motor function evaluations are separated into sections A1 and A2, where A1 is administered if the patient is able to understand and follow instructions and A2 is administered in the presence of comprehension deficits (Cote et al. 1986, 1989). Each motor item is rated for severity and each rating is weighted "according to the relative importance of a particular neurologic deficit" (Cote et al. 1989).
What are the key scores?	Scores from each section are summed to provide a total score out of 11.5 with lower scores indicating greater levels of neurological deficit.
What are its	A short, simple assessment that does not need to be

strengths?	administered by a neurologist. The CNS can be used to monitor change and predict patient outcomes such as length of stay, death, and dependency.
What are its limitations?	The CNS is focused on limb weakness, neglecting other possible neurological impairments (Cuspineda et al. 2003).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
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References

Cote R, Hachinski VC, Shurvell BL, Norris JW, Wolfson C. The Canadian Neurological Scale: a preliminary study in acute stroke. *Stroke* 1986;17:731-737.

Cote R, Battista RN, Wolfson C, Boucher J, Adam J, Hachinski V. The Canadian Neurological Scale: validation and reliability assessment. *Neurology* 1989;39:638-643.

Cuspineda E, Machado C, Aubert E, Galan L, Llopis F, Avila Y. Predicting outcome in acute stroke: a comparison between QEEG and the Canadian Neurological Scale. *Clin Electroencephalogr* 2003;34:1-4.

Canadian Occupational Performance Measure (COPM)

Q1. What does the Canadian Occupational Performance Measure test?

Used in conjunction with Occupational Therapy Guidelines for Client-centred Practice, the COPM provides an assessment of the individual's perceived occupational performance in the areas of self-care, productivity and leisure (Law et al. 1994, McColl et al. 2000, Finch et al. 2002).

Q2. Describe the Canadian Occupational Performance Measure

Administration of the COPM is a 5-step process conducted within an interview carried out by an occupational therapist. The interview focuses on identifying activities within each performance interview that are a "problem" (Law et al. 1990, Dedding et al. 2004). Problems are weighted in terms of importance, and the five most important are given a score on the bases of performance and satisfaction of the problem activity. Summary performance and satisfaction scores are achieved by separately summing the performance and satisfaction scores for all activities and dividing by five. Following, patient and therapist then create goals for therapeutic intervention and after a period of time, a follow up interview is performed (Law et al. 1990).

Q3. Describe some of the key Canadian Occupational Performance Measure numbers

Problem activities are weighted on a scale of 1 to 10, 10 being of the most important. The five most important are then rated on two scales of 1 to 10 for how well they perform the activity and how satisfied they are with their performance. The scores for the two scales are then multiplied by their corresponding importance rating to determine baseline scores for each activity out of 100 (Law et al. 1990)

Q4. What are the Advantages of the Canadian Occupational Performance Measure?

The item pool of the COPM is not fixed, rather it is defined by the respondent. Identifies treatment goals and treatment plans that are both relevant to the patient and in keeping with his/her own priorities (Law et al. 1990, Ripat et al. 2001, Wressle et al. 2002, Cup et al. 2003, Carswell et al. 2004).

Q5. What are the Disadvantages of the Canadian Occupational Performance Measure?

The interview process is not standardized and both the quality and adequacy of information may vary.

The client and therapist may need time and prior exposure or intervention to establish the necessary relationship for the COPM process to be successful (Law et al. 1990, Waters 1995).

Patients have reported difficulties with the self-evaluation task, and in translating their problems into a score (Dedding et al. 2004, Bodiam 1999, Wressle et al. 2002). Patients with cognitive deficits, lack of insight or communication problems, may not be able to participate in the process effectively (Law et al. 1990, Wressle et al. 2002, Cup et al. 2003, Carswell et al. 2004).

Canadian Occupational Performance Measure

Questions	Answer
What does it measure?	The individual's perceived occupational performance in the areas of self-care, productivity and leisure (Law et al. 1994, McColl et al. 2000, Finch et al. 2002).
What is the scale?	The interview identifies problem activities which are weighted in terms of importance, and the five most important are given a score on the bases of performance and satisfaction. Summary performance and satisfaction scores are the sum of the performance and satisfaction scores for all activities and divided by five. Goals are created for therapeutic intervention and a follow up interview is performed (Law et al. 1990).
What are the key scores?	Problem activities are weighted on a scale of 1 to 10, 10 being of the most important. Problems are rated on scales of 1 to 10 for how well they perform the activity and how satisfied they are with their performance. Scores for the two scales are multiplied by their corresponding importance rating to determine baseline scores for each activity out of 100 (Law et al. 1990).
What are its strengths?	The item pool of the COPM is defined by the respondent. Identifies treatment goals and treatment plans that are relevant to the patient and in keeping with his/her own priorities (Law et al. 1990, Ripat et al. 2001, Wressle et al. 2002, Cup et al. 2003, Carswell et al. 2004).
What are its limitations?	The interview process is not standardized. Client and therapist may need time, prior exposure or intervention to establish the necessary relationship (Law et al. 1990, Waters 1995). Patients have difficulties with the self-evaluation task, and in translating their problems into a score (Dedding et al. 2004, Bodiam 1999, Wressle et al. 2002). Those with cognitive deficits or communication problems may not be able to participate in the process effectively (Law et al. 1990, Wressle et al. 2002, Cup et al. 2003, Carswell et al. 2004).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	++	++	++	+	+(p-values only)	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR=Test re-test; IC= internal consistency; IO = Interobserver; varied (re. floor/ceiling effects; mixed results)

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Charlson Comorbidity Index

Q1. What does the Charlson Comorbidity Index test?

The Charlson Comorbidity Index (CCI) assesses comorbidity level by taking into account both the number and severity of 19 pre-defined comorbid conditions. It provides a weighted score of a client's comorbidities which can be used to predict short- and long-term outcomes such as function, hospital length of stay and mortality rates.

Q2. Describe the Charlson Comorbidity Index

The CCI is comprised of 19 comorbid conditions and depending how associated it is with 1-year mortality, each disease is given a different weight (Charlson et al. 1987).

Q3. Describe some of the key Charlson Comorbidity Index numbers

The weight of each disease is shown in the chart below:

Assigned Weight	Comorbid Conditions
1	Myocardial infarct, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, chronic pulmonary disease, connective tissue disease, ulcer disease, mild liver disease, diabetes
2	Hemiplegia, moderate or severe renal disease, diabetes with end organ damage, any tumor, leukemia, lymphoma
3	Moderate or severe liver disease
6	Metastatic solid tumor, AIDS

The total score in the CCI is determined by the combined weight of the patient's existing conditions. Higher scores represent worse conditions.

Q4. What are the Advantages of the Charlson Comorbidity Index?

Score can be assigned to the majority of patients.
Inexpensive.
Simple and readily available (Charlson et al. 1987).

Q5. What are the Disadvantages of the Charlson Comorbidity Index?

Poor to adequate correlations between the CCI and total numbers of medication consumed, numbers of hospitalization, length of stay, total costs, laboratory studies, therapeutic interventions, consultations and days of interruption of the rehabilitation program (Liu et al. 1997, Katz et al. 1996, Fischer, et al. 2006).

Charlson Comorbidity Index

Questions	Answer
What does it	Comorbidity level

measure?	
What is the scale?	The CCI is comprised of 19 comorbid conditions and depending how associated it is with 1-year mortality, each disease is given a different weight (Charlson et al. 1987).
What are the key scores?	The diseases are weighted and given scores of 1, 2, 3, or 6. The higher the combined weight of a patient's conditions, the more severe the condition.
What are its strengths?	Score can be assigned to the majority of patients. Inexpensive, no equipment required. Simple and readily available (Charlson et al. 1987).
What are its limitations?	Poor to adequate correlations between the CCI and total numbers of medication consumed, numbers of hospitalization, length of stay, total costs, laboratory studies, therapeutic interventions, consultations and days of interruption of the rehabilitation program (Liu et al. 1997, Katz et al. 1996, Fischer, et al. 2006).

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Chedoke McMaster Stroke Assessment Scale (CMSA)

Q1. What does the Chedoke McMaster Stroke Assessment Scale test?

The Chedoke McMaster Stroke Assessment Scale (CMSA) is a 2-part assessment consisting of a physical impairment inventory and a disability inventory. The impairment inventory is intended to classify patients according to stage of motor recovery while the disability inventory assesses change in physical function (Gowland et al. 1993).

Q2. Describe the Chedoke McMaster Stroke Assessment Scale

The scale's impairment inventory has 6 dimensions; shoulder pain, postural control, arm movements, hand movements, leg movements, and foot movements. Each dimension (with the exception of 'shoulder pain') is rated on a 7- point scale corresponding to Brunnstrom's 7 stages of motor recovery, which is listed below.

Stages of Motor Recovery of the Chedoke McMaster Stroke Impairment Inventory (Gowland et al. 1993)

Stages	Characteristics
1	Flaccid paralysis is present. Phasic stretch reflexes are absent or hypoactive. Active movement cannot be elicited reflexively with a facilitatory stimulus or volitionally.
2	Spasticity is present and is felt as a resistance to passive movement. No voluntary movement is present but a facilitatory stimulus will elicit the limb synergies reflexively. These limb synergies consist of stereotypical flexor and extensor movements.
3	Spasticity is marked. The synergistic movements can be elicited voluntarily but are not obligatory.
4	Spasticity decreases. Synergy patterns can be reversed if movement takes place in the weaker synergy first. Movement combining antagonistic synergies can be performed when the prime movers are the strong components of the synergy.
5	Spasticity wanes, but is evident with rapid movement and at the extremes of range. Synergy patterns can be revised even if the movement takes place in the strongest synergy first. Movements that utilize the weak components of both synergies acting as prime movers can be performed.
6	Coordination and patterns of movement can be near normal. Spasticity as demonstrated as resistance to passive movement is no longer present. Abnormal patterns of movement with faulty timing emerge when rapid or complex actions are requested.
7	Normal. A "normal" variety of rapid, age appropriate complex movement patterns are possible with normal timing, coordination, strength and endurance. There is no evidence of functional impairment compared with the normal side. There is a "normal" sensory-perceptual motor system.

The disability inventory consists of a gross motor index (10 items) and a walking index (5 items). With the exception of a 2-minute walking test (which is scored as either 0 or 2), items are scored according to the same 7-point scale used in the Functional

Independence Test (FIM) where 1 represents total assistance and 7 represents total independence.

Q3. Describe some of the key Chedoke McMaster Stroke Assessment Scale numbers

The impairment inventory yields a total score out of 42 while the disability inventory yields a total score out of 100 (with 70 points from the gross motor index and 30 points from the walking index).

Q4. What are the Advantages of the Chedoke McMaster Stroke Assessment Scale?

The use of Brunnstrom staging and FIM scoring increases the interpretability of the CMSA and may facilitate comparisons across groups of stroke patients (Gowland et al. 1993). The CMSA is relatively comprehensive and has been well studied for reliability and validity (Poole and Whitney 2001).

Q5. What are the Disadvantages of the Chedoke McMaster Stroke Assessment Scale?

Taking approximately 1 hour to complete, the length and complexity of the CMSA may make the scale less useful in clinical practice (Poole & Whitney 2001). As primarily a measure of motor impairment, the CMSA should really be accompanied by a measure of functional disability such as the BI or the FIM (Poole & Whitney 2001).

Chedoke McMaster Stroke Assessment Scale

Questions	Answer
What does it measure?	The Chedoke-McMaster Stroke Assessment Scale (CMSA) is a 2-part assessment consisting of a physical impairment inventory and a disability inventory. The impairment inventory is intended to classify patients according to stage of motor recovery while the disability inventory assesses change in physical function (Gowland et al. 1993).
What is the scale?	The scale's impairment inventory has 6 dimensions; shoulder pain, postural control, arm movements, hand movements, leg movements, and foot movements. Each dimension (with the exception of 'shoulder pain') is rated on a 7- point scale corresponding to Brunnstrom's 7 stages of motor recovery. The disability inventory consists of a gross motor index (10 items) and a walking index (5 items). With the exception of a 2-minute walking test (which is scored as either 0 or 2), items are scored according to the same 7-point scale where 1 represents total assistance and 7 represents total independence.
What are the key scores?	The impairment inventory yields a total score out of 42 while the disability inventory yields a total score out of 100 (with 70 points from the gross motor index and 30 points from the walking index).
What are its strengths?	The use of Brunnstrom staging and FIM scoring increases the interpretability of the CMSA and may facilitate comparisons

	across groups of stroke patients (Gowland et al. 1993). The CMSA is relatively comprehensive and has been well studied for reliability and validity (Poole and Whitney 2001).
What are its limitations?	Taking approximately 1 hour to complete, the length and complexity of the CMSA may make the scale less useful in clinical practice (Poole and Whitney 2001). As primarily a measure of motor impairment, the CMSA should really be accompanied by a measure of functional disability such as the BI or the FIM (Poole and Whitney 2001).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+	+++ (TR) +++ (IC) +++ (IC)	+	+++	+	+++	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

Gowland C, Stratford PW, Ward M, et al. Measuring physical impairment and disability with the Chedoke-McMaster Stroke Assessment. *Stroke* 1993; 24:58-63.

Poole JL, Whitney SL. Assessments of motor function post stroke: A review. *Physical and Occupational Therapy in Geriatrics* 2001; 19:1-22.

Clinical Outcomes Variables Scale (COVS)

Q1. What is the COVS Designed to Test?

The Clinical Outcomes Variables Scale (COVS) was designed as a tool to be used by physiotherapists in the assessment of functional mobility status in order to identify treatment goals and initiate treatment protocols (Seaby and Torrance 1989, Hajek et al. 1997, Eng et al. 2002).

Q2. Describe the COVS?

The 13-items comprising the COVS were selected in such a way as to be representative of outcomes associated with a regular physiotherapy caseload within the general rehabilitation population (Seaby and Torrance 1989, Finch et al. 2002). The concept of environmental barriers and the ability to negotiate within the environment is incorporated into the test items (Seaby and Torrance 1989), which include assessments of transfer abilities to and from bed and from the floor as well as wheelchair skill (Low Choy et al. 2002). Each item or functional task has its own 7-point rating scale based on the Patient Evaluation Conference System (PECS) (Harvey and Jellinek 1981) with 1 representing the worst possible outcome and 7 the best possible outcome (i.e. the highest amount of function). The COVS is usually administered by a trained physiotherapist and a full assessment can take 15-45 minutes to complete.

Q3. Describe some of the key COVS numbers.

Items can be considered individually or summed to provide a composite score ranging from 13 – 91. Items can also be summed in various combinations to provide assessments of ambulation (4 items), mobility in bed (2 items), transfers (2 items) and arm function (2 items) (Seaby and Torrance 1989).

Q4. What are the Advantages of the COVS?

Provides detail in areas of mobility not assessed by global functional assessments such as the FIM (Barclay-Goddard 2000, Low Choy et al. 2002).

Monitors motor tasks retrained by physiotherapists and includes both the use of assistive devices and the ability to negotiate environmental barriers.

Overall, has demonstrated good reliability and is user friendly in that it is designed to be performed as part of a routine physiotherapy assessment (Huijbregts 1996).

Q5. What are the Limitations of the COVS?

Administration of the COVS requires a fairly lengthy list of equipment and a substantial amount of time.

There is ongoing need for further validation of the COVS, which is relatively widely used.

Clinical Outcomes Variables Scale

Questions	Answer
What does it	Designed to assess functional mobility status in order to identify

measure?	treatment goals and initiate treatment protocols
What is the scale?	The 13-items comprising the COVS were selected in such a way as to be representative of outcomes associated with a regular physiotherapy caseload within the general rehabilitation population (Seaby and Torrance 1989, Finch et al. 2002). The concept of environmental barriers and the ability to negotiate within the environment is incorporated into the test items (Seaby and Torrance 1989), which include assessments of transfer abilities to and from bed and from the floor as well as wheelchair skill (Low Choy et al. 2002). Each item or functional task has its own 7-point rating scale based on the Patient Evaluation Conference System (PECS) (Harvey and Jellinek 1981) with 1 representing the worst possible outcome and 7 the best possible outcome (i.e. the highest amount of function). The COVS is usually administered by a trained physiotherapist and a full assessment can take 15-45 minutes to complete.
What are the key scores?	Items can be considered individually or summed to provide a composite score ranging from 13 – 91. Items can also be summed in various combinations to provide assessments of ambulation (4 items), mobility in bed (2 items), transfers (2 items) and arm function (2 items) (Seaby and Torrance 1989).
What are its strengths?	Provides detail in areas of mobility not assessed by global functional assessments such as the FIM (Barclay-Goddard 2000, Low Choy et al. 2002). Monitors motor tasks retrained by physiotherapists and includes both the use of assistive devices and the ability to negotiate environmental barriers. Overall, has demonstrated good reliability and is user friendly in that it is designed to be performed as part of a routine physiotherapy assessment (Huijbregts 1996).
What are its limitations?	Administration of the COVS requires a fairly lengthy list of equipment and a substantial amount of time. There is ongoing need for further validation of the COVS, which is relatively widely used.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+	+++ (TR) +++ (IO) ++ (IC)	++	+++	+	+	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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The Clock-Drawing Test

Q1. What does the Clock-Drawing Test test?

The CDT provides a quick assessment of visuospatial and praxis abilities and may detect deficits in both attention and executive dysfunction (Adunsky et al. 2002; Suhr et al. 1998; McDowell & Newell 1996).

Q2. Describe the Clock-Drawing Test Post-Stroke

The CDT involves having the patient draw a clock, place the numbers on the clock in their proper positioning and then place the arms of the clock at a requested time. The task itself is viewed as being highly complex, involving a number of neuropsychological abilities (Suhr et al. 1998). The clock drawing test is very quick and simple to administer, requiring approximately 1-2 minutes. The CDT has demonstrated acceptable levels of reliability and has been shown to correlate highly with other cognitive screening measures. Overall, it is short, simple, nonverbal and nonthreatening to patients. There are no costs associated with its administration and it is highly portable.

Q3. Describe some of the key Clock-Drawing Test numbers

Numerous scoring systems for the CDT have been suggested, ranging from simple to complex as well as from quantitative to qualitative. In general however, they all evaluate errors and/or distortions in the form of omissions of numbers and errors in their placement such as perseverations, transpositions, and spacing (McDowell & Newell 1996).

Q4. What are some of the advantages of the CDT?

The CDT is brief, inexpensive and easy to administer.

The CDT may help to create a more complete picture of cognitive function when it is used with other assessment tools (Ruchinkas & Curyto 2003; McDowell & Newell 1996; Suhr & Grace, 1999).

Despite different scoring systems, The CDT has demonstrated acceptable levels of reliability and has been shown to correlate highly with other cognitive screening measures. (Scanlan et al. 2002, Ruchinkas and Curyto 2003, McDowell and Newell 1996).

Q5. What are some of the Limitations of the CDT?

Like most other neuropsychological screening measures, the CDT is negatively influenced by increasing age, reduced education and the presence of depression (Ruchinkas & Curyto 2003; Lorentz et al. 2002).

The CDT may also be affected by visual neglect, hemiparesis and motor dyscoordination (Ruchinkas & Curyto 2003).

The most effective use of the CDT may be as a supplement to other cognitive assessments rather than as the sole, independent screening device for cognitive impairment (McDowell & Newell 1996). For example, it is an effective supplement to the MMSE and the CAMCOG.

The Clock-Drawing Test

Questions	Answer
What does it measure?	The CDT provides a quick assessment of visuospatial and praxis abilities and may detect deficits in both attention and executive dysfunction (Adunsky et al. 2002; Suhr et al. 1998; McDowell & Newell 1996).
What is the scale?	The CDT involves having the patient draw a clock, place the numbers on the clock in their proper positioning and then place the arms of the clock at a requested time. The task itself is viewed as being highly complex, involving a number of neuropsychological abilities (Suhr et al. 1998).
What are the key scores?	Numerous scoring systems for the CDT have been suggested, ranging from simple to complex as well as from quantitative to qualitative. In general however, they all evaluate errors and/or distortions in the form of omissions of numbers and errors in their placement such as perseverations, transpositions, and spacing (McDowell & Newell 1996).
What are its strengths?	The CDT is brief, inexpensive and easy to administer. The CDT may help to create a more complete picture of cognitive function when it is used with other assessment tools (Ruchinkas & Curyto 2003; McDowell & Newell 1996; Suhr & Grace, 1999). Despite different scoring systems, The CDT has demonstrated acceptable levels of reliability and has been shown to correlate highly with other cognitive screening measures. (Scanlan et al. 2002; Ruchinkas and Curyto 2003; McDowell and Newell 1996).
What are its limitations?	Like most other neuropsychological screening measures, the CDT is negatively influenced by increasing age, reduced education and the presence of depression (Ruchinkas & Curyto 2003; Lorentz et al. 2002). The CDT may also be affected by visual neglect, hemiparesis and motor dyscoordination (Ruchinkas & Curyto 2003). The most effective use of the CDT may be as a supplement to other cognitive assessments rather than as the sole, independent screening device for cognitive impairment (McDowell & Newell 1996). For example, it is an effective supplement to the MMSE and the CAMCOG.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	+++ (TR) ++ (IO)	+++	++	n/a	n/a	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Lorentz WJ, Scanlan JM, Borson S. Brief screening tests for dementia. *Canadian Journal of Psychiatry* 2002; 47:723-733.

Q6. Is the clock-drawing test a good test for visual neglect?

Performance on the CDT is most related to functions subserved by the right hemisphere (Suhr et al. 1998) and when used with other assessments may help to create a more complete picture of cognitive function. However, performance of the clock drawing task may be affected by other conditions prevalent in rehabilitation settings such as visual neglect, hemiparesis and motor dyscoordination (Ruchinkas & Curyto, 2003). Individuals with visual neglect, for instance, may omit numbers on one-half of the clock face.

Although this might seem sufficient for identification of neglect, the reported sensitivity of the CDT when used for this purpose appears poor (55.3%, Maeshima et al. 2001; 42%, Agrell et al. 1997) when compared to other assessments for neglect including cancellation tests, Albert's test and line bisection.

References

Suhr JA, Grace J, Allen J, Nadler JD, McKenna M. Quantitative and qualitative performance of stroke versus normal elderly on six clock drawing systems. *Archives of Clinical Neuropsychology* 1998; 13:495-502.

Ruchinkas RA, Curyto KJ. Cognitive screening in geriatric rehabilitation. *Rehabilitation Psychology* 2003; 48:14-22.

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Frenchay Activities Index

Q1. What does the Frenchay Activities Index test?

The Frenchay Activities Index (FAI) is a measure of instrumental activities of daily living (IADL) for use with patients recovering from stroke. The Index provides an assessment of a broad range of activities associated with everyday life.

Q2. Describe the Frenchay Activities Index

The FAI contains 15 items or activities that can be separated into 3 factors; domestic chores, leisure/work and outdoor activities. A score is assigned to the frequency with which each item or activity is undertaken over the past 3 or 6 months (depending on the nature of the activity).

Q3. Describe some of the key Frenchay Activities Index numbers

Frequency scores for each item or activity are between 1 and 4, where a score of 1 is indicative of the lowest level of activity. The scale provides a summed score from 15 – 60.

Q4. What are the Advantages of the Frenchay Activities Index?

Easy to use in a clinical setting (Wade 1992).

Its emphasis on frequency rather than quality of activity may reduce elements of subjectivity (Segal & Schall 1994)

FAI is inclusive of cognitively impaired stroke survivors.

It is suited to use with proxy respondents.

Simple to administer and requires no training or special equipment.

Q5. What are the Disadvantages of the Frenchay Activities Index?

Gender may have some influence on FAI scores (Holbrook & Skilbeck 1983).

FAI scores may be influenced significantly by age (Han et al. 2006, Appelros 2007).

Considerable variability in strength of agreement due to a lack of specific criteria or guidelines for scoring items (Piercy et al. 2000; Post and de Witte 2003).

Frenchay Activities Index

Questions	Answer
What does it measure?	Instrumental activities of daily living (IADL) for use with patients recovering from stroke.
What is the scale?	The FAI contains 15 items or activities that can be separated into 3 factors; domestic chores, leisure/work and outdoor activities. A score is assigned to the frequency with which each item or activity is undertaken over the past 3 or 6 months (depending on the nature of the activity).
What are the key scores?	Frequency scores for each item or activity are between 1 and 4, where a score of 1 is indicative of the lowest level of activity. The scale provides a summed score from 15 – 60.

What are its strengths?	Easy to use in a clinical setting (Wade 1992). Reduced elements of subjectivity, because there is an emphasis on frequency (Segal & Schall 1994) It is suited to use with proxy respondents. Inclusive of cognitively impaired stroke survivors. Simple to administer and requires no training or special equipment.
What are its limitations?	Gender may have some influence on FAI scores (Holbrook & Skilbeck 1983). FAI scores may be influenced significantly by age (Han et al. 2006, Appelros 2007). Considerable variability in strength of agreement (Piercy et al. 2000; Post and de Witte 2003).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	++ (TR) ++ (IO) +++ (IC)	+++	+++	+	++	+++

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Functional Independence Measure (FIM)

Q1. What is the FIM?

The FIM assesses physical and cognitive disability in term of burden of care – that is, the FIM score is intended to measure the burden of caring.

Functional Independence Measure (FIM) Items:

Bladder management	Tub and shower transfer
Bowel management	Locomotion (walking or wheelchair)
Social interaction	Climbing stairs
Problem solving	Eating
Memory	Grooming
Comprehension	Bathing
Expression	Dressing (upper body)
Bed-to-chair and wheelchair-to-chair transfer	Dressing (lower body)
Toilet transfer	Toileting

Q2. Describe the FIM?

The FIM is a composite measure consisting of 18 items assessing 6 areas of function. These fall into 2 basic domains; physical (13 items) and cognitive (5 items). Each item is scored on a 7-point Likert scale indicative of the amount of assistance required to perform each item (1=total assistance, 7 = total independence). A simple summed score of 18 – 126 is obtained where 18 represents complete dependence/total assistance and 126 represents complete independence. Subscale scores may also be used and may yield more useful information than combining them into a single FIM score (Linacre et al. 1994).

Q3. Describe some of the key FIM numbers.

Beninato et al. (2006) determined that 22, 17 and 3 were the change scores for the total FIM, motor FIM and cognitive FIM, respectively, which best separated those patients who had demonstrated clinically important change from those who had not.

Q4. What are the Advantages of the FIM?

The FIM has been well studied for its validity and reliability. FIM is widely used and has one scoring system increasing the opportunity for comparison.

Q5. What are the Limitations of the FIM?

Training and education in administration of the test is necessary (Cavanagh et al. 2000). The use of a single summed raw score may be misleading. Training and education of persons to administer the FIM may represent significant cost.

Functional Independence Measure

Questions	Answer
What does it measure?	Physical and cognitive disability in term of burden of care – that is, the FIM score is intended to measure the burden of caring.
What is the scale?	The FIM is a composite measure consisting of 18 items assessing 6 areas of function. These fall into 2 basic domains; physical and cognitive. Each item is scored indicating of the amount of assistance required to perform each item. A simple summed score is obtained determining the level of dependence of the individual. Subscale scores may yield more useful information than combining them (Linacre et al. 1994).
What are the key scores?	Beninato et al. (2006) determined that 22, 17 and 3 were the change scores for the total FIM, motor FIM and cognitive FIM, respectively, which best separated those patients who had demonstrated clinically important change from those who had not. Each item is scored on a 7-point scale (1=total assistance, 7 = total independence). A simple summed score of 18 – 126 is obtained where 18 represents complete dependence/total assistance and 126 represents complete independence.
What are its strengths?	The FIM has been well studied for its validity and reliability. FIM is widely used and has one scoring system increasing the opportunity for comparison.
What are its limitations?	Training and education in administration of the test is necessary (Cavanagh et al. 2000). The use of a single summed raw score may be misleading. Training and education of persons to administer the FIM may represent significant cost.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	+++ (TR) +++ (IO) +++ (IC)	+++	++	+++	++	++

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

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Hospital Anxiety and Depression Scale (HADS)

Q1. What does the HADS test?

The Hospital Anxiety and Depression Scale (HADS) is a bi-dimensional scale developed to identify cases of depression and anxiety disorders among physically ill patients (Zigmond 1983, Herrmann 1997, Bjelland 2002, Flint and Rifat 2002).

The HADS, in all forms, is comparable to other self-report measures of depression in terms of reliability. Concurrent validity of the HADS has been well established with reported correlations with the Beck Depression Inventory (Bjelland 2002), the General Health Questionnaire (Bjelland 2002), the MADRS (Bjelland 2002) and the "anxiety/depression item" of the EQ-5D (Marinus 2002).

Q2. Describe the HADS.

The HADS consists of 14 items which can be divided into 2 subscales of 7 items each; the anxiety subscale (HADS-A) and the depression subscale (HADS-D). The respondent rates each item on a 4-point scale.

Q3. What are the key scores of the HADS?

Scoring for each item is from 0 (absent) to 3 (extreme presence) with a total score of 42. Higher scores indicate greater levels of anxiety and depression.

Q4. What are the Advantages of the HADS Test?

No training is required to score or administer the test. Administration of the HADS appears to be well tolerated by medical patients who may be quite unwell (Herrmann 1997, Johnston et al. 2000).

Q5. What are the Limitations of the HADS Test?

One item, "I feel as if I am slowed down", has been identified as problematic (Flint and Rifat 2002, Johnston et al. 2000).

Exclusion of somatic items may represent a reduction in the face validity of the scale (Marinus et al. 2002).

Hospital Anxiety and Depression Scale

Questions	Answer
What does it measure?	The Hospital Anxiety and Depression Scale (HADS) is a bi-dimensional scale developed to identify cases of depression and anxiety disorders among physically ill patients (Zigmond 1983, Herrmann 1997, Bjelland 2002, Flint 2002).
What is the scale?	The HADS consists of 14 items which can be divided into 2 subscales of 7 items each; the anxiety subscale (HADS-A) and the depression subscale (HADS-D). The respondent rates each item on a 4-point scale.

What are the key scores?	Scoring for each item is from 0 (absent) to 3 (extreme presence) with a total score of 42. Higher scores indicate greater levels of anxiety and depression.
What are its strengths?	No training is required to score or administer the test. Administration of the HADS appears to be well tolerated by medical patients who may be quite unwell (Herrmann 1997, Johnston et al. 2000).
What are its limitations?	One item, "I feel as if I am slowed down", has been identified as problematic (Flint and Rifat 2002, Johnston et al. 2000). Exclusion of somatic items may represent a reduction in the face validity of the scale (Marinus et al. 2002).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	+++ (TR) ++ (IO) ++ (IC)	+++	++	+	+	+++

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Line Bisection Test

Q1. What does the LBT test?

The Line Bisection test is designed to detect the presence of unilateral spatial neglect.

Q2. Describe the LBT.

The LBT consists of 18 horizontal lines drawn on a single piece of paper. Patients are required to place a mark on each line that bisects it into two equal parts.

Q3. What are the key scores of the LBT?

The test is scored by measuring the distance from the bisection mark to the actual center of the line. A deviation of 6mm or more is indicative of unilateral spatial neglect. USN may also be suggested if the patient omits two or more lines on one half of the page.

Q4. What are the Advantages of the LBT Test?

Simple and inexpensive measure of USN.
Does not require formal training to administer.

Q5. What are the Limitations of the LBT Test?

The LBT may not be able to detect USN in as many as 40% of patients with severe USN (Ferber and Karnath 2001).

The LBT should only be used as a screening tool as negative results could be indicative of other syndromes, such as hemianopia.

Line Bisection Test

Questions	Answer
What does it measure?	Designed to detect the presence of unilateral spatial neglect.
What is the scale?	The LBT consists of 18 horizontal lines drawn on a single piece of paper. Patients are required to place a mark on each line that bisects it into two equal parts.
What are the key scores?	The test is scored by measuring the distance from the bisection mark to the actual center of the line. A deviation of 6mm or more is indicative of unilateral spatial neglect. USN may also be suggested if the patient omits two or more lines on one half of the page.
What are its strengths?	Simple and inexpensive measure of USN. Does not require formal training to administer.
What are its limitations?	The LBT may not be able to detect USN in as many as 40% of patients with severe USN (Ferber and Karnath 2001). The LBT should only be used as a screening tool as positive results could be indicative of other syndromes, such as hemianopia (Ferber and Karnath 2001).

Reference

Ferber S, Karnath HO. How to assess spatial neglect--Line Bisection or Cancellation Tests? *J Clin Expl Neuropsychol*, 2001; 23:599-607.

Medical Outcomes Study Short Form 36 (SF-36)

Q1. What does the SF-36?

The Medical Outcomes Study Short Form 36 (SF-36) is a generic health survey created to assess health status in the general population as part of the Medical Outcomes Study (Ware & Sherbourne 1992).

Q2. Describe the SF-36.

The SF-36 is comprised of 36 items drawn from the original 245 items generated by that study (Ware & Sherbourne 1992; McHorney et al. 1993). Items are organized into 8 dimensions or subscales (physical functioning, role limitations- physical, bodily pain, social functioning, general mental health, role limitations – emotional, vitality, and general health perceptions) and 2 questions intended to estimate change in health status over the past year are included. The recommended scoring system uses a weighted Likert system for each item. Items within subscales are summed to provide a summed score for each subscale or dimension. With the exception of the general change in health status questions, subjects are asked to respond with reference to the past 4 weeks.

Q3. What are the key scores of the SF-36?

Each of the 8 summed scores is linearly transformed onto a scale from 0 – 100 to provide a score for each scale. The component scores have also been standardized with a mean of 50 and standard deviation of 10 (Finch et al. 2002).

Q4. What are the Advantages of the SF-36 Test?

The SF-36 is simple to administer. Either form (self-completed or interview) of administration takes less than 10 minutes to complete (Hayes 1995). It has been shown to have reasonably high response rates.

Q5. What are the Limitations of the SF-36 Test?

Information contained within individual responses is lost in the total scale score (Dorman et al. 1999).

The SF-36 may not be adequate for serial comparisons of individual patients, but rather should be used for large group comparisons only (Dorman et al. 1998).

The subjective nature of the SF-36 may make proxy use difficult or even inadvisable (Dorman et al. 1998).

Some items have been questioned for their relevance to elderly populations.

Medical Outcomes Study Short Form 36

Questions	Answer
What does it measure?	The health status in the general population (Ware & Sherbourne 1992).
What is the scale?	The SF-36 is comprised of 36 items (Ware & Sherbourne 1992; McHorney et al. 1993). Items are organized into 8 dimensions or

	subscales and 2 questions intended to estimate change in health status over the past year are included. The recommended scoring system uses a weighted Likert system for each item.
What are the key scores?	Each of the 8 summed scores is linearly transformed onto a scale from 0 – 100 to provide a score for each scale. The component scores have also been standardized with a mean of 50 and standard deviation of 10 (Finch et al. 2002).
What are its strengths?	The SF-36 is simple to administer. Either form (self-completed or interview) of administration takes less than 10 minutes to complete (Hayes 1995). It has been shown to have reasonably high response rates.
What are its limitations?	Information contained within individual responses is lost in the total scale score (Dorman et al. 1999). The SF-36 may not be adequate for serial comparisons of individual patients (Dorman et al. 1998). The subjective nature of the SF-36 may make proxy use difficult (Dorman et al. 1998). Some items have been questioned for their relevance.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	++ (TR)	+++	+++	++	+++ (Note: 1 study reported ES)	+

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR=Test re-test; IC= internal consistency; IO = Interobserver; varied (re. floor/ceiling effects; mixed results).

References

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Mini-Mental State Examination (MMSE)

Q1. What does the MMSE test?

The MMSE was developed as a brief screening tool to provide a quantitative assessment of cognitive impairment and to record cognitive changes over time (Folstein et al. 1975).

Q2. Describe the MMSE.

The MMSE consists of 11 simple questions or tasks. Typically, these are grouped into 7 cognitive domains: orientation to time, orientation to place, registration of three words, attention and calculation, recall of three words, language and visual construction. Administration by a trained interviewer takes approximately 10 minutes.

The Mini-Mental State Examination

Maximum Score	Score	Testing Item
Orientation		
5		What is the date?
5		Where are we?
Registration		
3		Name 3 objects (1 second to say each) and then ask the patient to repeat all 3 after you have said them. Give one point for each correct answer. Continue repeating all 3 objects until the patient learns all 3. Count trials and record.
Attention and Calculation		
5		Serial 7's. One point for each correct response. Stop after 5 answers. As an alternative, spell "world" backwards.
Recall		
3		Ask for the 3 objects named in Registration. Give 1 point for each correct answer.
Language		
2		Name a pencil and watch
1		Repeat the following "No ifs, ands, or buts"
3		Follow a 3-stage command. "Take paper in your right hand, fold it in half, and put it on the floor."
1		Read and obey the following: CLOSE YOUR EYES
1		Write a sentence
1		Copy a design
30		

Q3. What are the key scores of the MMSE?

The test yields a total score of 30 and provides a picture of the subject's present cognitive performance based on direct observation of test items/tasks. A score of 23 or less is the

generally accepted cut-off point indicating the presence of cognitive impairment (Dick et al. 1984). Levels of impairment have also been classified as none (24-30); mild (18-24) and severe (0-17) (Tombaugh & McIntyre 1992).

Q4. What are the Advantages of the MMSE Test?

Only requiring 10 minutes to complete, the MMSE is brief, inexpensive and simple to administer.

Its widespread use and accepted cut-off scores increase its interpretability.

Q5. What are the Limitations of the MMSE Test?

Low levels of sensitivity have been reported, particularly among individuals with mild cognitive impairment and patients with right-sided strokes (Tombaugh & McIntyre, 1992; de Koning et al. 1998, Dick et al. 1984). The low level of sensitivity may be derived from the emphasis placed on language items and a paucity of visual-spatial items (Grace et al. 1995; de Koning et al. 1998; Suhr & Grace, 1999; de Koning et al. 2000).

The MMSE has been shown to be affected by age, level of education and sociocultural background, which may lead to misclassification (Tombaugh & McIntyre 1992, Bleeker et al. 1988, Lorentz et al. 2002).

Mini-Mental State Examination

Questions	Answer
What does it measure?	The MMSE is a brief screening tool that provides a quantitative assessment of cognitive impairment (Folstein et al. 1975).
What is the scale?	The MMSE consists of 11 simple questions or tasks, typically grouped into 7 cognitive domains: orientation to time, orientation to place, registration of three words, attention and calculation, recall of three words, language and visual construction.
What are the key scores?	The test yields a total score of 30, with a score of 23 or less generally accepted as the cutoff score indicating the presence of cognitive impairment (Dick et al. 1984). Levels of impairment have also been classified as none (24-30); mild (18-24) and severe (0-17) (Tombaugh & McIntyre 1992).
What are its strengths?	Only requiring 10 minutes to complete, the MMSE is brief, inexpensive and simple to administer. Its widespread use and accepted cut-off scores increase its interpretability.
What are its limitations?	Low levels of sensitivity have been reported, particularly among individuals with mild cognitive impairment and patients with right-sided strokes (Tombaugh & McIntyre, 1992; de Koning et al. 1998, Dick et al. 1984). The MMSE has been shown to be affected by age, level of education and sociocultural background, which may lead to misclassification (Tombaugh & McIntyre 1992, Bleeker et al. 1988, Lorentz et al. 2002).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	+++ (TR) ++ (IO) ++ (IC)	+++	++	n/a	n/a	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Tombaugh TN, McIntyre NJ. The Mini-Mental State Examination: A comprehensive review. *Journal of the American Geriatric Society* 1992; 40:922-935.

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Suhr JA, Grace J. Brief cognitive screening of right hemisphere stroke: relation to functional outcome. *Archives of Physical Medicine and Rehabilitation* 1999; 80:773-776.

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Lorentz WJ, Scanlan JM, Borson S. Brief screening tests for dementia. *Canadian Journal of Psychiatry* 2002; 47:723-733.

Grace J, Nadler JD, White DA, et al. Folstein vs. Modified Mini-Mental State Examination in geriatric stroke. *Arch Neurol* 1995; 52:477-484.

Q6. Describe the Benefit of adding the Clock-Drawing Test to the MMSE

Suggested solutions to the MMSE's poor sensitivity rates includes the use of age-specific norms (Bleecker et al. 1988) and the addition of a clock-drawing task to the test (Suhr & Grace, 1999). Clock-drawing tests themselves have been assessed as acceptable to patients, easily scored and less affected by education, age and other non-dementia variables than other very brief measures of cognitive impairment (Lorentz et al. 2002) and would have little effect on the simplicity and accessibility of the test.

References:

Bleecker ML, Bolla-Wilson K, Kawas C, Agnew J. Age-specific norms for the Mini Mental State Examination. *Neurology* 1988; 38:1565-1568.

Suhr JA, Grace J. Brief cognitive screening of right hemisphere stroke: relation to functional outcome. *Archives of Physical Medicine and Rehabilitation* 1999; 80:773-776.

Lorentz WJ, Scanlan JM, Borson S. Brief screening tests for dementia. *Canadian Journal of Psychiatry* 2002; 47:723-733.

Q7. A recent workshop (Hachinski 2006) intended to identify screening methods for the identification of individuals with possible cognitive and behavioral impairment, and to establish minimum data-sets for clinical practice and research studies of vascular dementia chose not to add the MMSE in the abbreviated assessment. Why?

The MMSE lacks sufficient assessment of executive functioning and is relatively insensitive to mild memory impairment (Hachinski et al. 2006). Currently there is no gold standard for the diagnosis and assessment of vascular cognitive impairment.

References

Hachinski V, Iadecola C, Petersen RC, et al. National Institute of Neurological Disorders and Stroke-Canadian Stroke Network vascular cognitive impairment harmonization standards. *Stroke* 2006; 37:2220-2241.

Montreal Cognitive Assessment

Q1. What does the MoCA test?

The MoCA is designed as a screening tool to detect mild cognitive impairment.

Q2. Describe the MoCA.

The MoCA uses tasks such as picture naming, clock drawing, and recall to assess the following domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation.

Q3. Describe some of the key MoCA numbers.

The MoCA yields a total score out of 30 with scores of 26 or lower indicating the presence of cognitive impairment.

Q4. What are the advantages of the MoCA?

The MoCA is able to detect mild forms of impairment in patients that score in the normal range on other assessment measures (i.e., the MMSE).

Q5. What are the disadvantages of the MoCA?

The validity of the MoCA has not been thoroughly tested.

Montreal Cognitive Assessment

Questions	Answer
What does it measure?	Designed as a screening tool to detect mild cognitive impairment (Nasreddine et al. 2005).
What is the scale?	The MoCA uses tasks such as picture naming, clock drawing and recall to assess the following domains: attention and concentration, executive functions, memory, language, visuoconstructional skills, conceptual thinking, calculations, and orientation.
What are the key scores?	The MoCA yields a total score out of 30 with scores of 26 or lower indicating the presence of cognitive impairment.
What are its strengths?	The MoCA is able to detect mild forms of impairment in patients that score in the normal range on other assessment measures (i.e., the MMSE) (Nasreddine et al. 2005).
What are its limitations?	The MoCA is a relatively new measurement tool; thus, its reliability and validity may not yet be thoroughly tested.

MONTREAL COGNITIVE ASSESSMENT (MOCA)

Date of birth :
Education :
Sex :
NAME :
DATE :

<p>VISUOSPATIAL / EXECUTIVE</p> <p>[] []</p>	<p>CLOCK (Ten past eleven)</p> <p>[]</p>	<p>POINTS</p> <p>1 point for each [] correct</p> <p>___/3</p>																																				
<p>NAMING</p> <p>___/3</p>																																						
<p>MEMORY Read list of words, subject must repeat them. Do 2 trials. Do a recall after 5 minutes.</p> <table border="1"> <thead> <tr> <th></th> <th>FACE</th> <th>VELVET</th> <th>CHURCH</th> <th>DAISY</th> <th>RED</th> </tr> </thead> <tbody> <tr> <td>1st trial</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2nd trial</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Recall > 5 min.</td> <td>[]</td> <td>[]</td> <td>[]</td> <td>[]</td> <td>[]</td> </tr> <tr> <td>Cues : Category</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Multiple choice</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>___/5</p>				FACE	VELVET	CHURCH	DAISY	RED	1st trial						2nd trial						Recall > 5 min.	[]	[]	[]	[]	[]	Cues : Category						Multiple choice					
	FACE	VELVET	CHURCH	DAISY	RED																																	
1st trial																																						
2nd trial																																						
Recall > 5 min.	[]	[]	[]	[]	[]																																	
Cues : Category																																						
Multiple choice																																						
<p>ATTENTION Subject has to repeat them in the forward order [] 2 1 8 5 4</p> <p>Read list of digits (1 digit/ sec). Subject has to repeat them in the backward order [] 7 4 2</p> <p>___/2</p>																																						
<p>Read list of letters. The subject must tap with his hand at each letter A. No points if > 1 error</p> <p>[] F B A C M N A A J K L B A F A K D E A A A J A M O F A A B</p> <p>___/1</p>																																						
<p>Serial 7 subtraction starting at 100 [] 93 [] 86 [] 79 [] 72 [] 65</p> <p>___/5</p>																																						
<p>LANGUAGE Repeat : I only know that John is the one to help today. []</p> <p>The cat always hid under the couch when dogs were in the room. []</p> <p>___/2</p>																																						
<p>Fluency / Name maximum number of words in one minute that begin with the letter F [] ____ (N > 10)</p> <p>___/1</p>																																						
<p>ABSTRACTION Similarity between e.g. banana - orange = fruit [] train - bicycle [] watch - ruler</p> <p>Memory recall > 5 min. If unable to recall, give category cue (e.g. body part, musical instrument...) or multiple choices</p> <p>___/2</p>																																						
<p>ORIENTATION [] Date [] Month [] Year [] Day [] Place [] City</p> <p>___/6</p>																																						
<p>© Z.Nasreddine MD Version May 8th, 2003</p>		<p>TOTAL ___/30</p>																																				

References

Nasreddine ZS, Phillips NA, Bédirian V, Charbonneau S, Whitehead V, Collin I, Cummings JL, Chertkow H. The Montreal Cognitive Assessment, MoCA: A brief screening tool for mild cognitive impairment. *J Am Geriatr Soc* 2005; 53:695–699.

Modified Ashworth Scale

Q1. What does the Modified Ashworth Scale test?

The Ashworth scale was originally developed to assess the efficacy of an anti spastic drug in patients suffering from multiple sclerosis (Ashworth, 1964). The scale is used to assign a subjective rating of the amount of resistance or tone perceived by the examiner as a limb is moved through its full range of motion.

Q2. Describe the Modified Ashworth Scale

The original Ashworth scale consisted of 5 grades from 0 – 4. A graded rating of spasticity is made from 0 – 4 to describe the resistance perceived while moving a limb passively about a joint, through its full range of motion, for one second (Pandyan et al. 1999; Pandyan et al. 2001)

Q3. Describe some of the key Modified Ashworth Scale numbers

Grade	Description
0	No increase in muscle tone.
1	Slight increase in muscle tone, manifested by a catch and release, or by minimal resistance at the end of range of motion when the affected part(s) is moved in flexion or extension.
1 ⁺	Slight increase in muscle tone, manifested by a catch followed by minimal resistance throughout the remainder (less than half) of the range of movement (ROM).
2	More marked increase in muscle tone through most of ROM, but affected part(s) easily moved.
3	Considerable increase in muscle tone, passive movement difficult.
4	Affected part(s) rigid in flexion or extension.

Ref: Bohannon and Smith (1987)

Q4. What are the Advantages of the Modified Ashworth Scale?

The modified Ashworth scale is routinely used to assess spasticity and indeed, is the current clinical standard (van Wijck et al. 2001).
No specialized equipment is required.

Q5. What are the Disadvantages of the Modified Ashworth Scale?

No standardized testing procedures or guidelines for the use of the scale exist.
While testing should be relatively brief, manipulation of the affected limb/joint may be uncomfortable for patients.
Training of test administrators is essential to the reliability of MAS.

Modified Ashworth Scale

Questions	Answer
What does it measure?	The amount of resistance or tone perceived by the examiner as a limb is moved through its full range of motion.

What is the scale?	The original Ashworth scale consisted of 5 grades from 0 – 4. A graded rating of spasticity is made from 0 – 4 to describe the resistance perceived while moving a limb passively about a joint, through its full range of motion, for one second (Pandyan et al. 1999; Pandyan et al. 2001)
What are the key scores?	0=No increase in muscle tone, 1= Slight increase in muscle tone, manifested by a catch and release, or by minimal resistance at the end of range of motion when the affected part(s) is moved in flexion or extension, 1+= Slight increase in muscle tone, manifested by a catch followed by minimal resistance throughout the remainder (less than half) of the range of movement (ROM), 2= More marked increase in muscle tone through most of ROM, but affected part(s) easily moved, 3= Considerable increase in muscle tone, passive movement difficult, 4= Affected part(s) rigid in flexion or extension.
What are its strengths?	The modified Ashworth scale is routinely used to assess spasticity and indeed, is the current clinical standard (van Wijck et al. 2001). No specialized equipment is required.
What are its limitations?	No standardized testing procedures or guidelines for the use of the scale exist. While testing should be relatively brief, manipulation of the affected limb/joint may be uncomfortable for patients. Training of test administrators is essential to the reliability of MAS.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	++ (TR) ++ (IO)	+	++	n/a	n/a	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Modified Rankin Handicap Scale

Q1. What does the Modified Rankin Handicap Scale test?

The Rankin scale is a global outcomes rating scale for patients post-stroke (Rankin 1957).

Q2. Describe the Modified Rankin Handicap Scale

Rankin Grade	Description
0	No Symptoms
1	No significant disability despite symptoms; able to carry out all usual duties and activities
2	Slight disability: unable to carry out all previous activities but able to look after own affairs without assistance.
3	Moderate disability: requiring some help, but able to walk without assistance
4	Moderately severe disability: unable to walk without assistance, and unable to attend to own bodily needs without assistance
5	Severe disability: bedridden, incontinent, and requiring constant nursing care and attention

(Ref: van Swieten et al. 1988)

Q3. Describe some of the key Modified Rankin Handicap Scale numbers

An original Rankin score of 1 indicated no significant disability and 5 the most severe level of disability. Van Swieten et al. (1988) expanded the ranking system to include 0; no symptoms. De Haan et al. (1995) suggest that scale scores may lend themselves to dichotomization (0-3 = mild to moderate disability & 4-5 = severe disability)

Q4. What are the Advantages of the Modified Rankin Handicap Scale?

The Modified Rankin Scale is an extremely simple, time efficient measure. Feasible for use large centers or in large trials (Wade 1992; de Haan et al. 1995). The MRS requires no special tools or training.

Q5. What are the Disadvantages of the Modified Rankin Handicap Scale?

The categories within the scale are broad and poorly defined, left open to the interpretation of the individual rater (Wilson et al. 2002). The use of dichotomization to classify global outcome may be associated with a loss of information with regard to benefits derived any rehabilitation intervention.

Modified Rankin Handicap Scale

Questions	Answer
What does it measure?	The Rankin scale is a global outcomes rating scale for patients post-stroke (Rankin 1957).
What is the scale?	The scale assigned a subjective grade from 1 – 5 based on level

	of independence with reference to prestroke activities rather than on observed performance of specific tasks.
What are the key scores?	An original Rankin score of 1 indicated no significant disability and 5 the most severe level of disability. Van Swieten et al. (1988) expanded the ranking system to include 0; no symptoms.
What are its strengths?	The Modified Rankin Scale is an extremely simple, time efficient measure. Feasible for use large centers or in large trials (Wade 1992; de Haan et al. 1995). The MRS requires no special tools or training.
What are its limitations?	The categories within the scale are broad and poorly defined (Wilson et al. 2002). The use of dichotomization to classify global outcome may be associated with a loss of information with regard to benefits derived any rehabilitation intervention.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	+++ (TR) ++ (IO)	++	+++	+	+	+

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Motor Assessment Scale (MAS)

Q1. What does the MAS test?

The Motor Assessment Scale (MAS) was developed to provide valid and reliable means of assessing everyday motor function following stroke (Carr et al. 1985). The MAS is based on a task-oriented approach to evaluation that assesses performance of functional tasks (Malouin et al. 1994).

Q2. Describe the MAS.

The MAS is comprised of 8 items corresponding to 8 areas of motor function. Each item, with the exception of general tonus, is assessed using a 7-point hierarchy of functional criteria. The performance of each criterion is associated with a score. The general tone item is evaluated through observation and handling during the assessment.

Q3. Describe some of the key MAS numbers.

Performance of each criterion is scored from 0 (most simple) to 6 (most complex) (Carr et al. 1985, Poole and Whitney 1988, Malouin et al. 1994, Sabari et al. 2005). The general tone item is scored such that a score of 4 represents optimal function while scores greater or less than 4 are indicative of degrees of hypertonus and hypotonus, respectively (Carr et al. 1985). Item scores, excluding general tonus, may be summed to provide an overall score out of a possible 48 points (Malouin et al. 1994).

Q4. What are the advantages of the MAS?

Equipment required is commonly available in a variety of settings. The MAS provides a brief and simple means by which to evaluate the performance of motor tasks following stroke. The MAS is freely available in Carr et al. (1985).

Q5. What are the disadvantages of the MAS?

The item "general tonus" is difficult to assess reliably. Poole and Whitney (1988) and Malouin et al. (1994) noted problems in the scoring hierarchy associated with the advanced hand activities item. Assessment by proxy is not appropriate as evaluation is performance-based.

Motor Assessment Scale

Questions	Answer
What does it measure?	The Motor Assessment Scale (MAS) was developed to provide valid and reliable means of assessing everyday motor function following stroke (Carr et al. 1985). The MAS assesses performance of functional tasks (Malouin et al. 1994).
What is the scale?	The MAS is comprised of 8 items corresponding to 8 areas of motor function. Each item, with the exception of general tonus, is assessed using a 7-point hierarchy of functional criteria. The

	performance of each criterion is associated with a score. The general tone item is evaluated through observation and handling during the assessment.
What are the key scores?	Performance of each criterion is scored from 0 (most simple) to 6 (most complex) (Carr et al. 1985, Poole and Whitney 1988, Malouin et al. 1994, Sabari et al. 2005). The general tone item is scored such that a score of 4 represents optimal function while scores greater or less than 4 are indicative of degrees of hypertonus and hypotonus, respectively (Carr et al. 1985). Item scores, excluding general tonus, may be summed to provide an overall score (Malouin et al. 1994).
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Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	+++ (TR) +++ (IO)	+++	++	+	+	+

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR=Test re-test; IC= internal consistency; IO = Interobserver; varied (re. floor/ceiling effects; mixed results)

References

Carr JH, Shepherd RB, Nordholm L, Lynne D. Investigation of a new motor assessment scale for stroke patients. *Phys Ther* 1985;65:175-180.

Malouin F, Pichard L, Bonneau C, Durand A, Corriveau D. Evaluating motor recovery early after stroke: Comparison of the Fugl- Meyer assessment and the Motor Assessment Scale. *Archives of Physical Medicine and Rehabilitation* 1994;75:1206- 1212.

Poole JL, Whitney SL. Motor Assessment Scale for stroke patients: concurrent validity and interrater reliability. *Archives of Physical Medicine and Rehabilitation* 1988;69:195-197.

Sabari JS, Lim AL, Velozo CA, Lehman L, Kieran O, Lai JS. Assessing arm and hand function after stroke: a validity test of the hierarchical scoring system used in the motor assessment scale for stroke. *Arch Phys Med Rehabil* 2005;86:1609-1615.

Motor-Free Visual Perception Test (MVPT)

Q1. What is the MVPT?

The MVPT measures visual perceptual skills.

Q2. Describe the MVPT

The MVPT measures visual perceptual skills in 5 areas: spatial relations, visual discrimination, figure-ground discrimination, visual closure and visual memory. The test consists of 36 items involving two dimensional configurations presented on separate cards or plates. Each plate consists of an example and a multiple choice response set of four alternative. One point is given for each correct response and scores range from 0 to 36. In addition to summary scores, the time to complete each item is noted and an average time per item is calculated. The test takes 10-15 minutes to administer and 5 minutes to score.

Q3. What are the Advantages of the MVPT?

Widely used, standardized test of visual perception (Mazer et al. 1998). Both simple, short (15 minutes) and well tolerated by subjects (Su et al. 2000). Age-specific norms are available for adults allowing for appropriate adjustment for age (Mazer et al. 1998).

Q4. What are the Limitations of the MVPT?

Provides a global score and therefore, gives less information about specific visual dysfunction than a scale providing domain-specific scores (Su et al. 2000).

Q5. How does the MVPT Assess Driving?

MVPT scores, using a cut-off of ≤ 30 , were significantly associated with driving test outcome (pass vs. fail) post-stroke. Poor MVPT scores were predictive of poor driving outcome (Mazer et al. 1998).

Motor-Free Visual Perceptual Test

Questions	Answer
What does it measure?	The MVPT measures visual perceptual skills.
What is the scale?	The MVPT measures visual perceptual skills in 5 areas. The test consists of 36 items involving two dimensional configurations presented on separate cards or plates. Each plate consists of an example and a multiple choice response set of four alternative. One point is given for each correct response. The time to complete each item is noted and an average time per item is calculated.
What are the key scores?	One point is given for each correct response and scores range from 0 to 36. MVPT scores, using a cut-off of ≤ 30 , were

	significantly associated with driving test outcome (pass vs. fail) post-stroke. Poor MVPT scores were predictive of poor driving outcome.
What are its strengths?	Widely used, standardized test of visual perception (Mazer et al. 1998). Both simple, short (15 minutes) and well tolerated by subjects (Su et al. 2000). Age-specific norms are available for adults allowing for appropriate adjustment for age (Mazer et al. 1998).
What are its limitations?	Provides a global score and therefore, gives less information about specific visual dysfunction than a scale providing domain-specific scores (Su et al. 2000).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+	+++ (TR) +++ (IC)	++	++	n/a	n/a	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

Mazer BL, Korner-Bitensky N, Sofer S. Predicting ability to drive after stroke. *Archives of Physical Medicine and Rehabilitation* 1998;79:743-750.

Su CY, Chang JJ, Chen HM, Su CJ, Chien TH, Huang MH. Perceptual differences between stroke patients with cerebral infarction and intracerebral hemorrhage. *Archives of Physical Medicine and Rehabilitation* 2000;81:714.

National Institutes of Health Stroke Scale

Q1. What does the National Institutes of Health Stroke Scale test?

The NIHSS is a measure of the severity of symptoms associated with cerebral infarcts and is used as a quantitative measure of neurological deficit post stroke.

Q2. Describe the National Institutes of Health Stroke Scale

In all, the NIHSS consists of 15 items used to assess severity of impairment in LOC, ability to respond to questions and obey simple commands, papillary response, deviation of gaze, extent of hemianopsia, facial palsy, resistance to gravity in the weaker limb, plantar reflexes, limb ataxia, sensory loss, visual neglect, dysarthria and aphasia severity (Brott et al. 1989, Heinemann et al. 1997, Anamaet 2002, Schlegel 2004). Items are graded on a 3 or 4 point ordinal scale on which 0 represents no impairment (Brott et al. 1989, Heinemann et al. 1997).

Q3. Describe some of the key National Institutes of Health Stroke Scale numbers

Total scores range from 0 – 42. Higher scores reflect greater severity. Stroke severity may be stratified on the basis of NIHSS scores as follows: >25 = very severe, 15 – 24 = severe, 5 – 14 = mild to moderately severe and 1 – 5 = mild impairment (Brott et al. 1989, Anamaet 2002).

Q4. What are the Advantages of the National Institutes of Health Stroke Scale?

Administration of the NIHSS is quick and simple.
Reliable use of the NIHSS has been reported when used by both non-neurologist physicians and experienced nursing staff (Brott et al. 1989, Goldstein et al. 1997, Dewey et al. 1999, Josephson et al. 2006).

Q5. What are the Disadvantages of the National Institutes of Health Stroke Scale?

Good reliability is dependent upon the use of trained raters and standardized application of the rating scale (Schmulling et al. 1998).

Many scale items are not testable in patients that have experienced severe stroke (Muir et al. 1996).

The NIHSS may favour assessment of left hemisphere strokes.

Training and standardized procedures are recommended to maintain scale reliability.

National Institutes of Health Stroke Scale

Questions	Answer
What does it measure?	The severity of symptoms associated with cerebral infarcts and is used as a quantitative measure of neurological deficit post stroke.
What is the scale?	In all, the NIHSS consists of 15 items used to assess severity of impairment. Items are graded on a 3 or 4 point ordinal scale on which 0 represents no impairment (Brott et al. 1989, Heinemann

	et al. 1997).
What are the key scores?	Total scores range from 0 – 42. Higher scores reflect greater severity. Stroke severity may be stratified on the basis of NIHSS scores as follows: >25 = very severe, 15 – 24 = severe, 5 – 14 = mild to moderately severe and 1 – 5 = mild impairment (Brott et al. 1989, Anamaet 2002).
What are its strengths?	Administration of the NIHSS is quick and simple. Reliable use of the NIHSS occurs when used by non-neurologist physicians and experienced nursing staff (Brott et al. 1989, Goldstein et al. 1997, Dewey et al. 1999, Josephson et al. 2006).
What are its limitations?	Good reliability is dependent upon the use of trained raters and standardized application of the rating scale (Schmulling et al. 1998). Many scale items are not testable in patients that have experienced severe stroke (Muir et al. 1996). The NIHSS may favour assessment of left hemisphere strokes. Training and standardized procedures are recommended to maintain scale reliability.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	++ (TR) ++ (IO) + (IC)	+++	+++	+	+	+ (lg. % score normal or untestable)

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

Brott T, Adams HP, Jr., Olinger CP, et al. Measurements of acute cerebral infarction: a clinical examination scale. *Stroke* 1989;20:864-870.

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Anemaet WK. Using standardized measures to meet the challenge of stroke assessment. *Top Geriatr Rehabil* 2002;18:47-62.

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Nine-Hole Peg Test

Q1. What does the Nine-Hole Peg Test test?

The Nine Hole Peg Test (NHPT) is a timed, quantitative measure of fine manual dexterity. It is also a component of the National Multiple Sclerosis Society's Multiple Sclerosis Functional Composite (MSFC). The MSFC is a multi-dimensional quantitative measure that evaluates three dimensions in multiple sclerosis.

Q2. Describe the Nine-Hole Peg Test

During this test the patient is seated at a table with a container holding 9 pegs and a wood or plastic block with 9 empty holes. While being timed, the patient is required to take the 9 pegs out of the container, one at a time, and place them into the empty holes in the block as quickly as possible. Once all of the holes are filled, the patient is required to remove each of the pegs, one at a time, and place them back into the container as quickly as possible. Total time required to complete the task is recorded. The test is run twice consecutively for the dominant hand and then twice consecutively for the nondominant hand.

Q3. Describe some of the key Nine-Hole Peg Test numbers

The two trials for each hand are averaged and then converted to the reciprocals of the mean times. These two reciprocals are then averaged. Lower scores indicate better fine manual dexterity. Mathiowetz et al. (1985) reported that on average, healthy male adults complete the NHPT in 19.0 seconds (SD 3.2) with the right hand, and in 20.6 seconds (SD 3.9) with the left hand. For healthy female adults, the NHPT was completed in 17.9 seconds (SD 2.8) and 19.6 seconds (SD 3.4) with the right and left hand, respectively.

Q4. What are the Advantages of the Nine-Hole Peg Test?

Norms for age, gender, and hand dominance have been established.
The test is quick and easy to administer.
The NHPT has demonstrated good reliability and validity.

Q5. What are the Disadvantages of the Nine-Hole Peg Test?

The NHPT is susceptible to practice effects.
Commercial versions differ from the original used by Mathiowetz et al., the norms generated from that study do not transfer over well.

Nine-Hole Peg Test

Questions	Answer
What does it measure?	Fine manual dexterity.
What is the scale?	The patient is seated at a table with a container holding 9 pegs

	and a wood or plastic block with 9 empty holes. The patient is required to take the 9 pegs out of the container, one at a time, and place them into the empty holes in the block as quickly as possible. Once all of the holes are filled, the patient is required to remove each of the pegs, one at a time, and place them back into the container as quickly as possible. Total time required to complete the task is recorded.
What are the key scores?	Mathiowetz et al. (1985) reported that on average, healthy male adults complete the NHPT in 19.0 seconds (SD 3.2) with the right hand, and in 20.6 seconds (SD 3.9) with the left hand. For healthy female adults, the NHPT was completed in 17.9 seconds (SD 2.8) and 19.6 seconds (SD 3.4) with the right and left hand, respectively.
What are its strengths?	Norms for age, gender, and hand dominance have been established. The test is quick and easy to administer. The NHPT has demonstrated good reliability and validity.
What are its limitations?	The NHPT is susceptible to practice effects. Commercial versions differ from the original used by Mathiowetz et al., the norms generated from that study do not transfer over well.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	+++ (TR) +++ (IO)	+++	+++	+	+	+

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

Mathiowetz V, Volland G, Kashman N, Weber K. Adult Norms for the Box and Block Test of Manual Dexterity. *The American Journal of Occupational Therapy* 1985;39:386-391

Orpington Prognostic Scale (OPS)

Q1. What does the Orpington Prognostic Scale test?

The Orpington Prognostic Scale (OPS; Kalra and Crome 1993) provides a clinically derived baseline assessment of stroke severity that can be used as a predictor of outcome in elderly stroke patients (Kalra et al. 1994). The assessment includes measures of motor deficit (arm), proprioception, balance and cognition.

Q2. Describe the Orpington Prognostic Scale

Clinical Features	Score
A. Motor deficit in arm (Lying supine, patient flexes shoulder to 90° and is given resistance) MRC grade 5 (Normal power) MRC grade 4 (Diminished power) MRC grade 3 (Movement against gravity) MRC Grade 1 – 2 (Movement with gravity eliminated or trace) MRC Grade 0 (No movement)	 0.0 0.4 0.8 1.2 1.6
B. Proprioception (eyes closed) (Locates affected thumb) Accurately Slight difficulty Finds thumb via arm Unable to find thumb	 0.0 0.4 0.8 1.2
C. Balance Walks 10 feet without help Maintains standing position Maintains sitting position No sitting balance	 0.0 0.4 0.8 1.2
D. Cognition Based on administration of Hodkinson's Mental Test Mental test score 10 Mental test score 8-9 Mental test score 5-7 Mental test score 0-4	 0.0 0.4 0.8 1.2
Hodkinson's Mental Test (Score one point for each question answered correctly) Age of patient Time (to the nearest hour) Address given for recall at the end of the test (42 West Street) Name of hospital Year Date of birth of patient Month Years of First World War Name of the Monarch Count backwards from 20 to 1	
Total Score = 1.6 + motor + proprioception + balance + cognition	

Ref: Kalra and Crome. 1993; www.strokecenter.org

Q3. Describe some of the key Orpington Prognostic Scale numbers

OPS scores range from 1.6 to 6.8 such that higher scores indicate greater deficit (Kalra & Crome 1993; Kalra et al. 1994; Lai et al. 1998). Deficits can be categorized as mild to moderate (scores <3.2), moderate to moderately severe (scores 3.2 – 5.2) and severe or major (scores >5.2) (Kalra and Crome 1993; Lai et al. 1998).

Q4. What are the Advantages of the Orpington Prognostic Scale?

It is simple to use and does not require extensive training to administer. OPS scores may assist in the appropriate allocation of stroke unit resources. May also help to target community based resources and rehabilitation more effectively. Use of OPS scores also permits the identification of a middle-group of patients with moderate deficits (Kalra et al. 1994, Pittock et al. 2008).

Q5. What are the Disadvantages of the Orpington Prognostic Scale?

The OPS score was intended for use with regard to rehabilitation and the appropriate targeting of therapy resources and should not be used for acute prognosis (Kalra et al. 1994).

Kalra et al. (1994) reported that the predictive values for dependence and discharge destination was not as strong in the middle group of patients (OPS 3 – 5, 2 weeks post stroke) as for patients with mild or severe deficits.

Orpington Prognostic Scale

Questions	Answer
What does it measure?	The Orpington Prognostic Scale (OPS; Kalra and Crome 1993) provides a clinically derived baseline assessment of stroke severity.
What is the scale?	The OPS is comprised of four subscales: motor deficit in the arm (Lying supping, patient flexes shoulder to 90° and is given resistance), proprioception (Locates affected thumb with eyes closed), balance and cognition (Based on administration of Hodkinson’s Mental Test).
What are the key scores?	OPS scores range from 1.6 to 6.8 such that higher scores indicate greater deficit (Kalra & Crome 1993; Kalra et al. 1994; Lai et al. 1998). Deficits can be categorized as mild to moderate (scores <3.2), moderate to moderately severe (scores 3.2 – 5.2) and severe or major (scores >5.2) (Kalra and Crome 1993; Lai et al. 1998).
What are its strengths?	It is simple to use and administer. OPS scores may assist in the appropriate allocation of resources. May also help to target community based resources and rehabilitation more effectively. Use of OPS scores also permits the identification of a middle-group of patients with moderate deficits (Kalra et al. 1994, Pittock et al. 2008).

What are its limitations?	The OPS score was intended for use with regard to rehabilitation and the appropriate targeting of therapy resources and should not be used for acute prognosis (Kalra et al. 1994). Kalra et al. (1994) reported that the predictive values for dependence and discharge destination was not as strong in the middle group of patients (OPS 3 – 5, 2 weeks post stroke) as for patients with mild or severe deficits.
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Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+	+++ (TR) +++ (IO)	++	++	n/a	n/a	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

Kalra L, Crome P. The role of prognostic scores in targeting stroke rehabilitation in elderly patients. *Journal of the American Geriatrics Society* 1993;41:396-400.

Kalra L, Dale P, Crome P. Evaluation of a clinical score for prognostic stratification of elderly stroke patients. *Age and Ageing* 1994;23:492-497.

Lai SM, Duncan PW, Keightly J. Prediction of functional outcome after stroke. Comparison of the Orpington Prognostic Scale and the NIH Stroke Scale. *Stroke* 1998;29:1838-1842.

Pitcock SJ, Meldrum D, Ni DC, Hardiman O, Moroney JT. The Orpington Prognostic Scale within the first 48 hours of admission as a predictor of outcome in ischemic stroke. *J Stroke Cerebrovasc Dis* 2003;12:175-181

Reintegration to Normal Living Index (RNLI)

Q1. What does the Reintegration to Normal Living Index test?

The RNLI assesses the degree to which individuals who had experienced traumatic or incapacitating illness achieve reintegration. Reintegration was defined as “the reorganization of physical psychological and social characteristics of an individual into a harmonious whole so that one can resume well-adjusted living after and incapacitating illness or trauma” (Wood- Dauphinee and Williams, 1987).

Q2. Describe the Reintegration to Normal Living Index

Eleven declarative statements are rated by the respondent on a 10 cm visual analogue scale (VAS) and scores are summed to provide a total score. Two subscales; Daily Functioning and Perceptions of Self are calculated by combining responses to the first 8 statements and the final 3 statements, respectively. A 3-point categorical system has also been used in the evaluation of stroke patients (Mayo et al. 2000, Mayo et al. 2002).

Q3. Describe some of the key Reintegration to Normal Living Index numbers

On the VAS, anchor statements are “Does not describe my situation” (1 or minimal reintegration) and “Fully describes my situation” (10 or maximum reintegration). Total score is out of 110 points that is proportionally converted to create a score out of 100 (Wood-Dauphinee et al. 1988).

Q4. What are the Advantages of the Reintegration to Normal Living Index?

The RNL is short and simple.

No training is required to administer and is available free of charge.

The RNLI does not appear to be affected by either age or gender (Steiner et al. 1996, Carter et al. 2000).

Q5. What are the Disadvantages of the Reintegration to Normal Living Index?

It is not recommended that healthcare professionals be used as proxy respondents (Wood-Dauphinee et al. 1988).

The use of a visual analogue scale in the assessment of stroke patients may not be appropriate.

No generally accepted standards for interpretation.

Stroke Impact Scale

Questions	Answer
What does it measure?	The degree to which individuals who had experienced traumatic or incapacitating illness achieve reintegration.
What is the scale?	Eleven declarative statements are rated by the respondent on a 10 cm visual analogue scale (VAS) and scores are summed to provide a total score. Two subscales; Daily Functioning and Perceptions of Self are calculated by combining responses to the

	first 8 statements and the final 3 statements, respectively. A 3-point categorical system has also been used in the evaluation of stroke patients (Mayo et al. 2000, Mayo et al. 2002).
What are the key scores?	On the VAS, anchor statements are “Does not describe my situation” (1 or minimal reintegration) and “Fully describes my situation” (10 or maximum reintegration). Total score is out of 110 points that is proportionally converted to create a score out of 100 (Wood-Dauphinee et al. 1988).
What are its strengths?	The RNL is short and simple. No training is required to administer and is available free of charge. The RNL does not appear to be affected by either age or gender (Steiner et al. 1996, Carter et al. 2000).
What are its limitations?	It is not recommended that healthcare professionals be used as proxy respondents (Wood-Dauphinee et al. 1988). The use of a visual analogue scale in the assessment of stroke patients may not be appropriate. No generally accepted standards for interpretation.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+	+++ (TR) +++ (IO)	+	++	+	++	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Rivermead Mobility Index (RMI)

Q1. What does the Rivermead Mobility Index test?

Mobility disability focused on fundamental aspects of mobility, that is, aspects of mobility independent of one's social environment (Collen et al. 1991; Wade, 1992).

Q2. Describe the Rivermead Mobility Index

The RMI is a scale consisting of 15 items that progress in difficulty from item 1 through 15. Fourteen items are questions about the performance of functional activities assessed by self-report and one activity is assessed by direct observation. All items generate a dichotomous yes/no response, with "yes" getting a score of 1.

Q3. Describe some of the key Rivermead Mobility Index numbers

The total scale score ranges from 0 – 15 where a score of 0 would indicate complete inability to perform any of the functional activities included in the assessment.

Q4. What are the Advantages of the Rivermead Mobility Index?

Assessment takes approximately 2 – 3 minutes and requires no special equipment or training (Collen et al. 1991; Forlander & Bohannon, 1999).

The RMI is a reliable instrument.

Q5. What are the Disadvantages of the Rivermead Mobility Index?

Increases in mobility achieved through environmental modifications, the use of assistive devices or with help from another person is not taken into account (Collen et al. 1991). Potential difficulties in the order of the first 3 scale items.

Rivermead Mobility Index

Questions	Answer
What does it measure?	Mobility disability focused on fundamental aspects of mobility, that is, aspects of mobility independent of one's social environment (Collen et al. 1991; Wade, 1992).
What is the scale?	The RMI is a scale consisting of 15 items that progress in difficulty from item 1 through 15. Fourteen items are questions about the performance of functional activities assessed by self-report and one activity is assessed by direct observation. All items generate a dichotomous yes/no response, with "yes" getting a score of 1.
What are the key scores?	The total scale score ranges from 0 – 15 where a score of 0 would indicate complete inability to perform any of the functional activities included in the assessment.
What are its strengths?	Assessment takes approximately 2 – 3 minutes and requires no special equipment or training (Collen et al. 1991; Forlander & Bohannon, 1999).

	The RMI is a reliable instrument.
What are its limitations?	Increases in mobility achieved through environmental modifications, the use of assistive devices or with help from another person is not taken into account (Collen et al. 1991). Potential difficulties in the order of the first 3 scale items.

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+++	+++ (TR) +++ (IO) +++ (IC)	+++	+++	+++	+++	varied

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Stroke Impact Scale (SIS)

Q1 What does the Stroke Impact Scale test?

The Stroke Impact Scale is a stroke specific, comprehensive, health status measure and is intended to include domains from across the full impairment-participation continuum (Duncan et al. 2000).

Q2. Describe the Stroke Impact Scale

Version 3.0 is comprised of 59 items in 8 domains (strength, hand function, ADL/IADL, mobility, communication, emotion, memory and thinking, participation) (Duncan et al. 1999). The SIS is a patient-based, self-report scale in which each item is rated on a 5-point Likert scale in terms of the difficulty the patient has experienced in completing each item during the past week. Using an algorithm, aggregate scores are generated for each domain. Domain scores range from 0 – 100. One item assesses the subject's overall perception of recovery.

Q3. Describe some of the key Stroke Impact Scale numbers

A score of 1 represents an inability to complete the item and a score of 5 represents no difficulty experienced at all. The perception of recovery scale ranges from 0 to 100 where 0 indicates “no recovery” and 100 indicates “full recovery”.

Q4. What are the Advantages of the Stroke Impact Scale?

The patient-centered nature of the scale's development may enhance its relevance to patients.

Simple to administer and has been tested for use as a mailed questionnaire.

Q5. What are the Disadvantages of the Stroke Impact Scale?

No standards or normative scores are available.

The emotion domain seems to be less psychometrically acceptable than the other 7 domains (Duncan et al. 1999).

Stroke Impact Scale

Questions	Answer
What does it measure?	The Stroke Impact Scale is a stroke specific, comprehensive, health status measure and is intended to include domains from across the full impairment-participation continuum (Duncan et al. 2000).
What is the scale?	Version 3.0 is comprised of 59 items in 8 domains (Duncan et al. 1999). The SIS is a patient-based, self-report scale in which each item is rated on a 5- point Likert scale in terms of the difficulty the patient has experienced in completing each item during the past week. Using an algorithm, aggregate scores are generated for each domain. Domain scores range from 0 – 100.

	One item assesses the subject's overall perception of recovery.
What are the key scores?	A score of 1 represents an inability to complete the item and a score of 5 represents no difficulty experienced at all. The perception of recovery scale ranges from 0 to 100 where 0 indicates "no recovery" and 100 indicates "full recovery".
What are its strengths?	The patient-centered nature of the scale's development may enhance its relevance to patients. Simple to administer and has been tested for use as a mailed questionnaire.
What are its limitations?	No standards or normative scores are available. The emotion domain seems to be less psychometrically acceptable than the other 7 domains (Duncan et al. 1999).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
+	++ (TR) +++ (IC)	+	+++	+	+	varied

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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Timed Up and Go Test

Q1. What is the TUG Test?

The TUG is an objective measure of basic mobility and balance maneuvers that assesses an individual's ability to perform sequential motor tasks relative to walking and turning.

Q2. Describe the TUG Test?

The TUG requires subjects to stand up from a chair, walk a distance of 3 meters, turn around, walk back to the chair and seat themselves. The subject is permitted to use a walking aid if one is required normally and is allowed to walk through the test once before the timed session is undertaken.

Q3. What are the Key scores of the TUG?

The TUG score consists of the time taken to complete the test activity, in seconds.

Q4. What are the Advantages of the TUG Test?

The TUG is quick and easy to administer, requiring no specialized equipment or training. Timed scores are objective, straightforward, and more sensitive to change over time than ordinal measures (Whitney et al. 1998).

Q5. What are the Limitations of the TUG Test?

The TUG may not be suitable for use with cognitively impaired subjects; although verbal cueing during the test may eliminate this concern (Rockwood et al. 2000, Nordin et al. 2006).

Normative data is not available, so its primary use has been assessment of change within the individual (Thompson & Medley 1995).

Overall, the TUG is a limited measure that addresses relatively few aspects of balance and yields a narrower assessment than more comprehensive balance measures, such as the Berg Balance Scale (Whitney et al. 1998).

Timed "Up and Go"

Questions	Answer
What does it measure?	The TUG is an objective measure of basic mobility and balance maneuvers that assesses an individual's ability to perform sequential motor tasks relative to walking and turning.
What is the scale?	The TUG requires subjects to stand up from a chair, walk a distance of 3 meters, turn around, walk back to the chair and seat themselves. The subject is permitted to use a walking aid if one is normally required and is allowed to walk through the test once before the timed session is undertaken.
What are the key scores?	The TUG score consists of the time taken to complete the test activity, in seconds.
What are its	The TUG is quick and easy to administer, requiring no

strengths?	specialized equipment or training. Timed scores are objective, straightforward, and more sensitive to change over time than ordinal measures (Whitney et al. 1998).
What are its limitations?	The TUG may not be suitable for use with cognitively impaired subjects; although verbal cueing during the test may eliminate this concern (Rockwood et al. 2000, Nordin et al. 2006). Because normative data is not available for the TUG, its primary use has been assessment of change within the individual (Thompson & Medley 1995). Overall, the TUG is a limited measure that addresses relatively few aspects of balance and yields a narrower assessment than more comprehensive balance measures, such as the Berg Balance Scale (Whitney et al. 1998).

Summary

Reliability		Validity		Responsiveness		
Rigor	Results	Rigor	Results	Rigor	Results	Floor/Ceiling
++	+++ (TR) +++ (IO)	+++	+++	+	++	n/a

NOTE: +++=Excellent; ++=Adequate; +=Poor; n/a = insufficient information; TR = Test re-test; IC = Internal consistency; IO = Interobserver; varied (re floor/ceiling effects; mixed results)

References

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