OCCUPATIONAL THERAPY COGNITIVE ASSESSMENT INVENTORY – *Version 4 (August 2020)*

Purpose: This inventory was developed to complement the clinical reasoning algorithm entitled *An OT Approach to Evaluation of Cognition/Perception* (Vancouver Coastal Health, 2013). This is an inventory of cognitive (but not perceptual) assessment tools identified by OTs within Vancouver Coastal Health (VCH) and Providence Health Care (PHC). These tools are not meant to be used in isolation during the process of assessment but, instead, during Steps 4 & 5 of the assessment process (as per the algorithm). Although this inventory provides a comprehensive list of standardized tools available to OTs to measure cognition, it is not an exhaustive list. The primary focus is measurement of cognition in the context of function/occupation.

Updates for 2020:

1. The list of cognitive tests has been divided into 4 sections (*Ctr+Click to follow each link*): **(I) Screening (impairment)**, **(II)Screening (task performance)**, **(III) In-Depth (Impairment)**, **(IV) In-Depth (Task Performance)**, and **(V) "Niche" assessments** (i.e., tests generally not used by VCH & PHC OTs but are included because of their use in specific programs).
2. For some tests (where relevant), this current update includes comments about use in virtual health/telehealth (*in the Pros & Cons column – search for "virtual health"*). This is not an exhaustive commentary (*being that this is beyond the scope of this document*).

Category of Assessment: adopted from *An OT Approach to Evaluation of Cognition/Perceptio*", Vancouver Coastal Health, April 2011 (rev. March 2013)

	Screening assessment	In-depth assessment
Level of task performance (ICF: activity & participation)	• Provides screening assessment in context of occupation *(e.g. Kettle Test, partial EFPT)* • May provide higher ecological & predictive validity than impairment-based screening	• In-depth understanding of the impact of cognitive deficits on occupation *(e.g. MET, TFLS)* • May provide higher ecological & predictive validity than in-depth assessment at level of impairment
Level of Impairment (ICF: body-structure)	• To augment screening at level of task performance *(e.g. MoCA, Cognistat, MMSE, RBANS)* • Be aware of limitations (e.g. predictive & ecological validity, depth of assessment)	• To provide some in-depth understanding of specific cognitive components such as memory, attention. *(e.g. RBMT, TEA)* • Be aware of limitations (e.g. predictive & ecological validity)

Statistical Evaluation Criteria: *from StrokEngine (accessed June 2020),* **http://strokengine.ca/assess/statistics-en.html**

Reliability	
Internal consistency (Chronbach's α or split-half statistics)	
Excellent	≥ 0.80
Adequate	0.70-0.79
Poor	< 0.70
Test-re-test or Inter-rater reliability (ICC or kappa statistics)	
Excellent	≥ 0.75
Adequate	0.40-0.74
Poor	<0.40
Validity: *Concurrent and construct/convergent correlations*	
Excellent	≥ 0.60
Adequate	0.31-0.59
Poor	≤ 0.3

DEFINITIONS: *Note: in deciding whether or not an assessment tool is precise, it is important to consider both reliability and validity*.

Reliability: "*Does the test provide a consistent measure?*"

Internal consistency = the extent to which the items of a test measure various aspects of a common characteristic (e.g., "memory"). Do the items/subtests of the measure consistently measure the same aspect of cognition as each other?

Test-retest reliability = the extent to which the measure consistently provides the same results when used a second time (re-test). *Parallel-form reliability* would involve 2 different/alternate versions of the same test.

Inter-rater reliability = the extent to which two or more raters (assessors) obtain the same result when using the same instrument – do they produce consistent results?

Validity: "*Does the test measure what it is supposed to measure?*" (relates to: "*What is the meaning of the score*?")

Criterion validity = the extent to which a new measure is consistent with a gold standard criterion (i.e., a previously validated measure). For ***concurrent validity***, the measures are administered at approximately the same time. For ***predictive validity***, typically one measure is administered at some time prior to the criterion measure (to examine whether the measure can predict, or correlate with, the outcome of a subsequent criterion event). Note: *poor* concurrent validity would suggest that the tests being compared measure different constructs; *adequate* concurrent validity suggests some shared variance in the constructs being measured; and *excellent* concurrent validity suggests that the tests measure very similar constructs. If 2 tests are highly correlated with each other, then one would want to question the need for having both tests – generally the clinician would select the one more appropriate for the situation.

Construct validity = the extent to which a test can be shown to measure its intended construct, e.g. "memory" or "cognition for everyday function". The construct validation process may be used when a gold standard (previously validated criterion) does not exist, thus, when one cannot test for concurrent validity. ***Convergent validity*** is the extent to which a test agrees with another test (or test) believed to be measuring the same attribute. ***Discriminant validity*** is the extent to which tests that are supposed to be unrelated are, in fact, unrelated (i.e., measure different things). ***Group differences*** refers to: "*Does the measure allow you to differentiate between 2 or more populations*?" for example as determined by analyzing for statistically significant differences between the groups on the measure. ***Ecological validity*** refers to: "*Does the measure reflect behaviours/function that actually occur in natural/everyday settings*?"

I. SCREENING (IMPAIRMENT):

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Cognistat (CAS II) **CAS= Cognistat Assessment System** (Previously known as the **Neurobehavioral Cognitive Status Examination**) Screening assessment; Impairment level *(global)* **Population** ☒ Applicable to all adults (adolescents to seniors) ***Norms**: Based on 4 groups, each with about 30 subjects: age 20-30, age 40-66, and age 70-92.* http://www.cognistat.com/ Training webinar: https://www.cognistat.com/training-media	This cognitive screen has 11 subtests which screen for 3 general factors (consciousness, attention and orientation) and 5 major ability areas (memory, (language, construction, calculation, and reasoning). There are 2 tests: the original Cognistat, and the Cognistat Five. Each has 3 formats available: paper-and-pencil test; web-based, computer assisted format; and computerized PDF format that does not require web access. The Cognistat Five provides an even quicker screening tool (measuring orientation, memory and construction) – reported to provide an "MCI" index as a risk assessment algorithm for MCI and dementia. **Time to administer**: original takes approx 45 minutes. There is a screening score also available for the original version – but with a high false positive. It takes about 5 minutes for the Cognistat Five version. **Scoring**: 1. Original (long) version provides a "cognitive profile" (not a single numerical score), with a cut-off for each test. Cut-off scores place client within categories of "average range" or "mild", "moderate, or "severe" cognitive disability. *Note: As per 1995 manual: "…profiles in which no score falls below the gray zone cannot be taken as proof that no cognitive dysfunction exists…" (p. 18). 2. Also (relatively new), both versions provide a "MCI Index" reportedly to help estimate the risk for mild cognitive impairment (MCI) and dementia, but with a reminder provided that the score does NOT diagnose MCI or dementia (which of course depends on the clinical judgment of the appropriate expert). **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability**: • Excellent inter-rater reliability (*psychiatry*). • Adequate to excellent test-retest reliability (*psychiatry*). • *no studies were found for geriatrics or brain injury* **Predictive Validity:** • Poor validity for predicting FIM self-care scores upon discharge from acute care, and adequate validity for predicting FIM cognitive scores (*Chinese adults with stroke*). • Cognistat's comprehension and repetition subscales were found to be useful in predicting (accounts for 64.4% of the regression model) functional independence as measured by the Barthel Index for persons recovering from stroke. • Cognistat's comprehension and similarities subscales were found to be useful in predicting functional performance as measured by the FIM for persons recovering from stroke. **Group Differences:** • Differentiates between healthy controls and: - dementia - neurosurgical groups - stroke - individuals on an outpatient geriatric mental health team • May help differentiate between individuals with late onset depression and dementia. **Other Aspects of Validity:** • Adequate to excellent concurrent validity with "parallel" neuropsych tests for a range of neurological & psychiatric diagnoses, including traumatic brain injury. • Poor to adequate concurrent validity with an IADL measure, the Observed Tasks of Daily Living-Revised (*persistent schizophrenia*). • Lacks correlation with the BADS (i.e., basic cognition vs. executive function) (*schizophrenia*). • Non-significant correlations with a measure of functional outcome (Routine Task Inventory), thus lacking ecological validity (*schizophrenia*). • Moderate validity of using both the Cognistat and the Rivermead Behavioural Memory Test together to detect MCI and mild dementia.	**Pros**: • Overall: useful as a measure of gross cognitive impairment for the purpose of identifying areas needing more in-depth assessment (Shea et al., 2017). • Broader profile than SMMSE or MoCA, more sensitive than MMSE (but there are many limitations – see Cons below). • The reatively new MCI Index might be helpful for OTs working in programs/clinics involving clients with MCI and dementia. • CAS-II is aimed primarily at helping to identify onset of mild cognitive impairment (MCI) and dementia; thus more of a tool to help with medical or neuropsych diagnosis, than to inform the OT about cognition relating to function. • Has been found to identify presence of cognitive impairment in TBI (reliably classifies individuals in acute & post-acute settings into the Cognistat impairment categories). • May help predict function (as measured by Barthel Index FIM) for persons with stroke. • When used with the Rivermead Behavioural Memory Test can detect MCI and mild dementia. **Cons**: • This test has become very expensive (e.g., for the paper test: $525.00 USD for a starter kit (with 16 test booklets) and $425.00 USD for a package of 25 additional test booklets) – thus $17.00 USD per test. • Significant difficulties with reading, writing and spelling will not be detected. • Poor performance may reflect a long-term learning disability (rather than new, acquired cognitive impairment). • Although it may help to determine specific cognitive impairments, evidence varies to support concurrent/predictive validity of function. • Scoring is a profile (not a single numerical score) – although some researchers create a composite score for purposes of their research, e.g. Drane et al., 2003; and there is now a MCI Index score. • "Screening" score (of original version) produces high false positive (so it is recommended to use total score). • Cautions in interpreting results if presence of frontal lobe lesion, pain, medications, sleep deprivation, sensory deficits, language deficits. For example, it may not be sensitive to cognitive impairment in individuals with frontal lobe lesions (they might not perform in the impaired range on this test).

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
			• Cautions also with individuals with lower levels of education and older adults (this test may overestimate cognitive impairment). • May not be sensitive to mild impairment. For example, the Cognistat detected only 60-80% of cognitive deficits diagnosed by a skilled neuropsychologist (Nokleby et al., 2008) (*stroke*). • It may be too simple for post-acute, high functioning TBI. • Not recommended by researchers to use with TBI for planning rehab & community reintegration (because it's not sensitive enough to residual cognitive deficits across different stages of recovery). • One study found a gender bias in the judgment subtest (females more often score 1 rather than 2 as compared to males).
The Cognitive Assessment of Minnesota (CAM) Screening assessment; Impairment level *(global)* **Population** ☒ Traumatic brain injury ☒ Stroke ***Norms**: sample of 200 healthy adults, age 18-70 years.* http://www.pearsonclinical.com/therapy/products/100000577/cognitive-assessment-of-minnesota-the.html	The CAM is a hierarchical approach to screening a range of cognitive skills to identify general areas of cognitive impairment and to guide treatment activities. It can be used as a baseline and to measure change, and to indicate areas for in-depth investigation. The 17 subtests (with total of 29 items) range from simple to complex and cover: attention, memory, visual neglect, math, ability to follow directions, and judgment. These are grouped into 4 categories: fund of acquired information or store of knowledge (18 items); manipulation of old knowledge, calculation or problem solving (9 items); social awareness & judgment (1 item); and abstract thinking (1 item). **Time to administer:** approximately 40 minutes, or two 20-minute sessions. **Scoring:** The raw scores are plotted on a scoring profile, which shows a pattern of how many items fit into "none to mild impairment", "moderate impairment" or "severe impairment". *Note: As per manual (1993): If an individual scores at below the cut-off, then it is extremely probable that s/he has cognitive impairment. If s/he scores at above the cut-off, then there is still a 23.5% chance that impairment is present. If the examiner continues to suspect cognitive impairment, then further assessment is required. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability:** • Excellent internal consistency (*residents of long term care facilities with acquired brain injury*). • Excellent inter-rater reliability (*acquired brain injury*). • Excellent test-retest reliability (*acquired brain injury + healthy controls*). **Predictive Validity:** • Does not have validity for predicting functional status 3 months later using FIM + FAM (*acute care inpatients up to 3 months post acquired brain injury*). **Group Differences:** • Differentiates between healthy controls and acquired brain injury. • Differentiates between 3 groups of cognitive impairment (mild, moderate, severe) which were been determined by clinician ratings. **Other Aspects of Validity:** • Adequate concurrent validity with 2 impairment-based tests: MMSE and Porteus Maze Test Quotient (*acquired brain injury*).	**Pros**: • Easy to administer allowing a quick and inclusive screen of significant areas of cognition. • Screens a variety of cognitive skills in a short time. • Utilizes materials that are easily accessible and inexpensive. • Uses familiar tasks and gives clear directions and guidelines. • Relatively inexpensive (<$200 USD for manual and 25 test booklets). **Cons**: • May not pick up on subtle/mild cognitive deficits • Not appropriate for individuals with severe visual-perceptual motor or visual acuity deficits, or aphasia. • Not a complete test battery or in-depth cognitive evaluation; the CAM is best used as a screen of abilities and deficits. Identifies problem areas to further evaluate. • No alternate version available for re-test. • For acute care inpatients with acquired brain injury, does not predict function at 3 months later. • Limited research available for review beyond the 1993 test manual.
EXIT-25 (The Executive Interview) Screening assessment; Impairment level	The EXIT-25 was developed as a "bedside screen" of executive dysfunction. It provides a standardized clinical assessment (screen) of executive function. The 25 items assess perseveration, intrusions, apathy, disinhibition,	**Reliability**: • Excellent interrater reliability (dementia; late-life depression). • Excellent internal consistency (dementia); poor internal consistency (*late-life depression*).	**Pros**: • The EXIT-25 is readily available on internet (no cost involved). • Quick to administer

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Population ☒ Dementia ☒ Schizophrenia Test form (including instructions & scoring): https://sapepper.barshop.uthscsa.edu/wp-content/uploads/2017/06/EXIT25-Instructions-and-Interview-Form.pdf	verbal fluency, design fluency, frontal release signs, motor/impulse control, imitation behavior, and other clinical signs associated with frontal system dysfunction. Note: More recently, researchers have identified that the EXIT appears to require EF (executive functions) but also reflects non-EF demands, and therefore should be considered a measure of global cognitive function rather than pure EF measure. There have been attempts to shorten it, and the QuickEXIT (14 items) appears to have the best psychometrics of these attempts. **Time to administer**: EXIT-25 takes approximately 15-20 minutes **Scoring**: EXIT-25 scores range from 0 to 50, with high scores indicating impairment. Scores ≥ 15/50 suggest clinically significant EF impairment in young and elderly populations. (Normal range for young adults ≤ 5/50; normal range for elderly adults ≤ 10/50.) **Minimal Clinical Difference (MCD)**: *not determined to date.*	**Predictive Validity**: • Adequate predictive validity of change scores of EXIT25 on change scores in an IADL measure – over time for individuals (whereas NO correlation between change scores in EXIT25 and change scores in MMSE). (*elderly retirees age 70+ at non-institutional levels of care, evaluated a 3 points over 3 years*). **Group Differences:** • Differentiates between healthy controls and individuals with dementia. • One study indicates EXIT25 does NOT differentiate between healthy controls and mild cognitive impairment (MCI), whereas another study indicates it differentiates between healthy controls and "mild dementia" (and that MMSE does not). **Other Aspects of Validity**: • There is concurrent validity of the EXIT25 and MRI findings that show frontal lobe pathology, as analysed by comparing individuals above and below a cut-off score of 15/50 and the effect of various frontal lesions (analysis does not use correlational analysis) (*individuals seen at a dementia assessment clinic*). • Excellent concurrent validity with MMSE. (*individuals seen at a dementia assessment clinic*) • Excellent concurrent validity with MMSE, 3MS, and cognitive score of FIM (*traumatic brain injury inpatients*). • Marked ceiling effects when used with TBI outpatients. • Excellent concurrent validity with BADS, but non-significant correlation with 2 neuropsych measures of executive function (Stroop & Trail Making) (*TBI outpatients*). • Excellent concurrent validity with the Direct Assessment of Functional Status-Revised test (DAFS-R) (normal controls and also people with dementia); and adequate concurrent validity for persons with mild cognitive impairment (likely because of higher variance in scores for the MCI group). • Adequate concurrent validity with an IADL score (from the Physical Self-Maintenance Scale and Instrumental Activities of Daily Living Scale) (*at a geriatric memory clinic*). • Excellent concurrent validity with another screen of executive functions/frontal lobe dysfunction (the Frontal Assessment Battery) (*at a geriatric memory clinic*). • Adequate to excellent concurrent validity with neuropsychiatric tests measures that aim to assess executive functioning including: Wisconsin Card Sorting Test (r=0.54), Lezak's Tinker Toy	• May add important information about executive functioning when screening for cognitive impairment (to add to information from other cognitive screens which do not screen well for executive dysfunction, such as the MMSE) – for individuals with dementia, and also in psychiatry (Royall et al., 2000; Schillerstrom et al, 2003), but unclear how useful it is for other populaions including outpatients with TBI (and with mild/moderate disability). • For individuals with dementia, it links well to function. • Has also been shown to have utility for individuals with psychiatric diagnoses. **Cons**: • Not a pure measure of executive functions; more accurately it is a global measure of cognition. • Practice is needed to administer and score appropriately. • May not be able to detect MCI, or cognitive impairment in TBI outpatients. • Moderately influenced by age and education. • Research findings advise that there was NO clear cut-off score found for presence of dementia; and advised that other testing is required to confirm dementia (Moorhouse et al, 2009).

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
		Test (r=0.57), Test of Sustained Attention (time, r=0.82; errors, r= 0.83), and Trail Making Part B (r=0.64) (*older adults assessed for dementia*).	
Galveston Orientation and Amnesia Test (GOAT) Screening assessment; Impairment level **Population** ☒ Traumatic brain injury For copy of test: (*note that current interpretation of scoring differs from this version*): http://scale-library.com/pdf/Galveston_Orientation_Amnesia_Test.pdf Description: https://www.physio-pedia.com/Galveston_Orientation_%26_Amnesia_Test	The GOAT was the first of its kind developed to assess for post-traumatic amnesia (PTA) following head trauma, including for use on a serial basis such as could be incorporated into physician patient rounds or the recording of vital signs. It is used particularly in the United States. (Note: PTA refers to a post-traumatic state of confusion involving disorientation, anterograde amnesia, and retrograde amnesia.) **Be aware that opioid use (such as is widely prescribed following TBI for pain/headache management) can confound results, especially for anterograde amnesia and orientation items** (Marshman et al., 2018). The GOAT has 16 questions (sometimes categorized under 10 items), presented orally, to which the patient can respond orally or in writing. It is primarily a measure of orientation/ disorientation, and not of memory (the memory portion relates to specific aspects of pre- and post-injury, i.e. measures of retrograde and anterograde amnesia). Bode et al. (2000) presents an alternate method of administration and scoring to allow for more efficient assessment of PTA (with items presented in order of difficulty, easiest to most difficult); however, this does not appear to have been adopted widely. There is also a modified version for people with aphasia which uses multiple choice questions (**AGOAT**) although it's not readily available and requires further research/evaluation (Jain, 2010). There is also a related version for children age 3 to 15: the Children's Orientation and Amnesia Test (**COAT**) (see Ewing-Cobbs, 1990). **Time to administer**: about 10 minutes **Scoring**: total score 100. Points are deducted for each incorrect response, and subtracted from 100 for the final score: • 75-100 (updated from 76-100 in original paper) is considered normal, i.e. the client does not have PTA • If the score is <75, then the person is in a period of post-traumatic amnesia (PTA). PTA has ended when their score becomes 75 or	**Reliability**: • Excellent inter-rater reliability (*individuals hospitalized with closed head injury of varying severity*). • Internal consisteny was demonstrated using Rasch analysis. **Predictive Validity**: • PTA (as measured by GOAT) is a predictor of functionlal outcome (as measured by Disability Rating Scale and Functional Independence Measure): in that for one study it accounted for 20% to 45% of variance (Zafonte et al, 1997). *Note: this does NOT represent a specific cut-off score for the GOAT (or a specific length of PTA) as being predictive of function*. • PTA for more than 2 to 4 weeks (and certainly more than 12 weeks) post-emergence from coma are more likely to have moderate to severe disability 6-12 months later as described on Glasgow Outcome Scale (Levin et al. 1979; Katz & Alexander, 1994). (*Note: the GOS categorizes severe disability as including dependence for ADL, and moderate disability as including independent ADL but reduced employment capacity: http://www.strokecenter.org/wp-content/uploads/2011/08/glasgow_outcome.pdf*). • Individuals with presence of PTA at start of rehab have longer rehab stays than individuals without presence of PTA at start of rehab – thus individuals without presence of PTA recover sooner/faster in rehab than those with PTA (Bode et al., 2000) – *Note: this is NOT the same thing as stating that individuals with presence of PTA will not benefit from rehab.* **Other Aspects of Validity**: • Construct validity: there is an association with CT findings (Levin et al, 1979). • Construct validity (in terms of measuring initial cognitive recovery): adequate correlation with Glasgow Coma Scale (which measures very initial cognitive state/recovery; GOAT measures next step, PTA). [Note: it has been found that individuals should not be assessed with the GOAT until their Glasgow Coma Scale (GCS) score is 12 or higher, optimally if score is 14 (ideally with eye opening scored 2, verbal response scored 4, and motor responsescored 6) (Silva et al., 2007)]. • Concurrent validity: excellent correlation with other measures of PTA and orientation.	**Pros**: • No cost and readily available on-line (http://scale-library.com/pdf/Galveston_Orientation_Amnesia_Test.pdf) • Quick to administer, if your goal is to assess for post traumatic amnesia (which is not typically a goal for OT assessment). • Modifications are permitted for non-verbal patient (such as when tracheostomy is in place), e.g., by providing a calendar so that they can point to a date; allowing them to write their responses. **Cons**: • It is difficult to identify any relevant purpose for an OT to use this measure – being that it's a measure of PTA and, therefore, of primary interest to physicians and not OTs (and function). • Some physicians have asked OTs to use the GOAT to help the team determine if the client is appropriate for rehab; however, research does not verify that there is predictive validity for this purpose. • Results can be confounded if the patient is taking opioids (pain/headache management) – therefore be cautious in interpreting results for such patients. • Some of the memory items are difficult to verify by the assessor – and, therefore, the test can be difficult to score. The assessor will need to know the answers ahead of time (e.g., mode of transport used to get the patient to hospital). Some items might not be verifiable and, therefore, it might not be possible to determine if the patient's response is an error (for example, represents confabulation) or is accurate. • GOAT is difficult with non-verbal clients – be careful in interpreting results for individuals who are non-verbal or who have aphasia (because poor results may represent non-verbal status or aphasia, and NOT post-traumatic amnesia). Consider using AGOAT instead, unless the person is simply non-verbal and there is no question of aphasia (thus has good comprehension and can express themselves without difficulty in writing (for the GOAT). • "...Due to its simplicity, it should not be used as the sole assessment to determine PTA. Using the GOAT in combination with other tests may yield more efficient and cohesive results..." (https://goltv.com/g/galveston-orientation-amnesia-test/, *accessed June 2018*).

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
	greater on 2-3 consecutive administrations (Ellenberg et al, 1996; Zafonte et al. 1997; Novack et al. 2000). **Minimal Clinical Difference (MCD)**: not applicable – instead see Scoring above.		
Lowenstein Occupational Therapy Cognitive Assessment Battery (LOTCA, LOTCA-II, DLOTCA, DLOTCA-G, and FLOTCA) Screening assessment; Impairment level *(global)* **Population** **LOTCA/DLOTCA**: ☒ Neurological deficits ☒ Dementia ☒ Mental Illness **LOTCA-G/DLOTCA-G**: ☒ Older adults (age 70+) ☒ Dementia **FLOTCA**: ☒ Traumatic brain injury (age 18-49) ***Norms****: see manuals. Psychometrics and norms also available for children age 6-12 (DOTCA-Ch).* To purchase: ***DLOTCA and DLOTCA-G are readily available; other versions may be difficult to find*** www.maddak.com www.ncmedical.com https://www.therapro.com/Browse-Category/Cognitive-Assessments/DLOTCA.html	Assesses basic cognitive skills. Used for treatment planning and to measure change. In 2011, the **LOTCA** (2nd edition, i.e. LOTCA-II)) and LOTCA-G were updated to become the Dynamic LOTCA (i.e., **DLOTCA**) and Dynamic LOTCA-G (i.e., **DLOTCA-G**). The "dynamic" factor refers to use of mediation guidelines and scoring based the mediation guidelines and scoring used with the Toglia Category Assessment. *Previous versions (i.e. LOTCA) are now difficult to find for purchase*. The **DLOTCA** has 28 subtests in 7 cognitive areas (orientation, awareness, visual perception, spatial perception, praxis, visuomotor construction, and thinking operations), whereas the **LOTCA-II** has 26 items in 6 categories. The **LOTCA-G** (geriatric version) has enlarged items to reduce visual and motor coordination difficulties, shortened sub tests & reduced administration time; and addition of memory subtests. There are 24 subtests in 8 cognitive areas (additional area is memory). The Functional LOTCA (**FLOTCA**) was developed in 2016 for use with clients with TBI. It consists of only 3 tasks: (1) planning a route and navigating on a map, (2) organizing tools in a toolbox, and (3) planning a daily schedule according to a list of activities. (Schwartz et al, 2016) ***as of spring 2018, it appears that the manual (English) is available only in Israel.* **Time to administer:** approx 30-90 minutes for DLOTCA; 30-45 minutes for DLOTCA-G (although one source gives 15 min); 30-60 minutes for FLOTCA. **Scoring:** Most subtests are scored 1-4 (from "fails to perform" to "demonstrates good performance"); some are scored 1-5 or 1-8. Total score for LOTCA-II ranges 26-115. Results provide a cognitive profile, with lower scores = lower cognitive functioning (presence of cognitive impairment). Authors caution that use of total score impacts the clinician's ability to identify specific areas of impairment. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability:** • Excellent internal consistency for LOTCA (*stroke, traumatic brain injury, healthy controls, schizophrenia*). • Excellent inter-rater reliability for LOTCA (stroke, traumatic brain injury, healthy controls) and for DLOTCA (*stroke, healthy controls*). • LOTCA: Excellent internal consistency in all domains except poor for the memory domain (*stroke rehab patients and healthy controls*). • DLOTCA: Adequate to excellent internal consistency. **Predictive Validity:** • *Not established to date* **Group Differences:** • differentiates between healthy controls and: - stroke/brain injury - dementia (LOTCA-G) - stroke (LOTCA-G) • For LOTCA-G: most subtests differentiate between individuals with mild vs. moderate dementia. • DLOTCA: differentiates between stroke and healthy controls in terms of performance before mediation; and levels of mediation required (*stroke needing higher levels*). **Other Aspects of Validity:** • Construct validity supported for LOTCA using factor analysis. • Adequate concurrent validity with LOTCA and MMSE (*stroke*). • Construct validity of the DLOTCA-G matches with the LOTCA-G and DLOTCA. • Adequate concurrent validity with LOTCA and FIM-cognitive; lower correlations between LOTCA and FIM-total (but higher correlation than between MMSE and FIM-total) (*stroke*). • Adequate concurrent validity with LOTCA-G and MMSE, with strongest correlations between MMSE and with LOTCA-G categories of orientation, visuomotor organization, thinking operations, and memory (*dementia*).	**Pros:** • A performance test with minimal verbal requirements. • Procedures are included for use with clients with aphasia. • Can be used to evaluate change over time (i.e., to re-test clients). • There is also a version available for geriatric population (DLOTCA-G). • DLOTCA/DLOTCA-G provide a more detailed cognitive profile than the MMSE, and may be stronger than MMSE in predicting function (where function is measured by FIM). **Cons:** • No memory subtests in the LOTCA/DLOTCA (but present in the LOTCA-G/DLOTCA-G). • Can be long and difficult to administer. • One study found a substantial ceiling effect for a sample of adults with schizophrenia – therefore, may not be useful with this population (and perhaps also may not be useful with adults with mild cognitive impairment). • Scoring for the DLOTCA-G has been found to be hard to understand and some of the administration instructions are difficult to follow – thus the OT needs extra time to become familiar with these procedures. • Cost: approx $300.00-$350.00 USD each for DLOTCA, DLOTCA-G. • Manual for FLOTCA not readily available (as of spring 2018 and again spring 2020).

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Mini Mental State Examination (MMSE) (aka Folstein MMSE; Standardized MMSE – SMMSE) and MMSE-2 ***See also Modified MMSE (3MS) – next item*.** **Note: do not confuse the use of "SMMSE" in the literature to refer to a different test, the "Short form MMSE" – they are unrelated.* Screening assessment; Impairment level *(global)* **Population** ☒ Stroke ☒ Older adults ☒ Dementia ☒ Caution with: - mild cog impairment - influence of age, language, culture, depression MMSE: https://www.heartandstroke.ca/-/media/pdf-files/canada/clinical-update/allen-huang-cognitive-screening-toolkit.ashx?la=en&hash=631B35521724C28268D0C2130D07A401E33CDBB0 SMMSE: https://www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/cogimp-smmse.pdf To purchase the MMSE-2 versions (standard, brief, expanded), and versions in different languages: https://www.parinc.com/Products/NEUROPSYCHOLOGY/NeuropsychologicalScreening	Developed as a brief, objective assessment to detect dementia. • To improve reliability, the SMMSE was developed, to provide strict guidelines for administration and scoring. • In an attempt to improve the MMSE, the 3MS was developed – see below. • The MMSE-2 versions (standard, brief and expanded) were developed to expand usefulness with clients who have mild cognitive impairment. There are 2 alternate versions for use with test re-test. (see ++ details about the MMSE-2 at https://www.parinc.com, including bibliography and a presentation) **Time to administer standard versions:** 10 minutes (20 min for MMSE-2 expanded) **Scoring for MMSE and SMMSE** (out of 30): • 26-30 = could be normal • 20-25 = mild cog impairment • 10-20 = mod cog impairment • 0-9 = severe cog impairment *some researchers suggest ≤24 as 'suggesting dementia' or cognitive impairment (e.g. Godefroy et al., 2011) *another paper recommends high cut-off, ≤27 for those with high education achievement to detect MCI (Erdodi et al., 2020) *different researchers have created cut-off and percentile tables to allow interpretation of results in context of different ages and levels of education, or changed the weighing of how items have scored, but nothing has become a standard yet for interpretation. **Minimal Clinical Difference (MCD**: For healthy adults age 55 and older, a score would need to change at least 3 to 4 points for the assessor to be confident that the change is not due to measurement error (Feeney et al, 2014; Kopecek et al., 2016).	**Reliability (MMSE)**: • Poor internal consistency (older adults without cognitive impairment); excellent internal consistency (*older adults with Alzheimer disease*). • Adequate inter-rater reliability for MMSE and excellent for SMMSE (which has stricter administration and scoring guidelines). • *See information at https://www.parinc.com for detailed information about MMSE-2*. **Predictive Validity (MMSE):** • Poor validity of MMSE in predicting discharge FIM motor scores in some research (geriatric rehabilitation; subacute stroke); another study indicated no predictive value in predicting FIM scores (*geriatric assessment program*). • Poor predictive validity of cognitive sequelae at 6 months post discharge of survivors of critical illness. • *See information at https://www.parinc.com for detailed information about MMSE-2*. **Group Differences:** • Differentiates between community- vs. facility-dwelling older adults. • In some studies, MMSE failed to differentiate between mild dementia and healthy adults. In one study, MMSE did differentiate, but with less accuracy than a combination of cognitive/ neuropsych tests. **Other Aspects of Validity:** • SMMSE is stronger at identifying dementia than MMSE. • Mixed findings on concurrent or predictive validity with FIM (*adequate for inpatient rehab acquired brain injury using FIM+FAM; poor for geriatric inpatiens using FIM*). • Excellent concurrent validity between MMSE and a measure of daily function ("Direct Assessment of Functional Status') (MMSE score mean=23.8, but ranging up to 30/30) – but note that the strongest correlation was between MMSE 'orientation' and DAFS 'time orientation' (*dementia*), thus not really with a daily function task/activity. • Poor convergent validity with the Mini-Cog Screen. • Mixed findings in predicting fitness for driving (road test outcomes). • MMSE unable to identify psychiatric inpatients who had significant deficits on a neuropsych battery (thus suggesting that MMSE may seriously underestimate cognitive impairment in this population).	**Pros**: • Quick screen, easy to administer. • Widely utilized thus well-known by health care team members. • Available in many languages (but for a cost). • SMMSE is recommended by BC Ministry of Health as one tool for use in the assessment of frail elderly. • Some research has supported MMSE as a useful screen in community-based health care to capture early cognitive impairment. **Cons**: • Lack of psychometric studies involving younger adults and adults with acquired brain injury. • Does not assess executive functions (including judgement and reasoning) – thus MMSE is less useful, for example, in frontotemporal or vascular dementia (MoCA is more sensitive). • Not recommended for inpatient psychiatric population. • Age, level of education, culture may affect (bias) the score – for example there may be a "false positive" for individuals with low education. (*Consider using the RUDAS instead with individuals with low education/who are illiterate*). • Relies heavily on verbal response, reading, writing; therefore, individuals with hearing or visual impairment, have low English literacy, etc. may perform poorly even when cognitively intact. • Not suitable to be given through an interpreter, or to person with aphasia. • Not sensitive to mild cognitive impairment (in which case the MoCA or Cognistat might be recommended as a screen). • Although there is some evidence of convergent validity with function, generally studies show poor predictive validity of function. • Cannot be used as a stand-alone tool in the detection of dementia (Cochrane review, 2016). • Caution against using MMSE as stand-alone tool in determining decision-making capacity (Pachet et al. 2010). • Cannot be used reliably as an indicator of driving risk. *See also*: https://www.crisisprevention.com/Blog/October-2010/A-Discussion-of-Cognitive-Screening-Instruments-an
Modified Mini-Mental State Exam (3MS) Screening assessment; Impairment level *(global)*	The 3MS is a screen to detect and monitor progression of dementia. It was developed in 1996 to extend the scope of the MMSE (see item above), including to improve discrimination among different levels of dementia (*more*	**Reliability**: • Excellent internal consistency – higher than the MMSE, likely reflecting in part the larger number of subtests (*older adults with and without cognitive impairment*)	**Pros**: • Can obtain an MMSE score & 3MS score from same test. **Cons**:

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Population ☒ Stroke ☒ Older adults ☒ Dementia ☒ Caution with: - mild cog impairment - influence of age, language, culture, depression http://adrc.usc.edu/3ms/ http://adrc.usc.edu/wp-content/themes/neuADRC/pdfs/A_3MSManual1996.pdf	*recently an expanded version of MMSE-2 was developed, as per above*). The 3MS contains additional items to the MMSE, and extended scoring to add precision (with 4 additional subtests, and modified scoring procedure to extend from the 30-point range of the MMSE to a 100-point range). The additional items to the MMSE cover: long term memory, verbal fluency, abstract thinking, and recall of 3 words an additional time. **Time to administer:** 15 minutes. **Scoring**: Maximum score of 100. A score of ≤77 may indicate cognitive impairment, in particular if education is 9+ years and age <80 years. As with the MMSE, it is important to take into consideration influence of age, education and culture – although one study found that corrected cut-off scores did not improve accuracy in screening for cognitive impairment or dementia (O'Connell et al., 2004). See Ryan et al. (2019) for normative data. **Minimal Clinical Difference (MCD)**: A clinically meaningful change (in measuring cognitive decline) is considered ≥5 points, although some researchers suggest 10 points (*elderly*).	• Excellent test-retest reliability (*various studies*) • Adequate to excellent inter-rater reliability (*general psychiatric population; elderly in community*) **Predictive Validity:** • Predictive of later functional decline – with function measured by a semi-structed interview conducted with an informant, assessing a person's difficulties performing various ADLs for non-physical reasons (*adults with probable dementia*) (Zahodne et al., 2013). **Group Differences:** • For older adults with low education, 3MS may be better than the MMSE in differentiating between healthy adults and those with Alzheimer disease. **Other Aspects of Validity:** • Excellent concurrent validity with MMSE, Blessed Dementia Scale, Camdex Cognitive scale (CAMCOG) (*various studies, dementia and elderly*). • Adequate to excellent convergent validity with various neuropsych tests such as the Boston Naming Test, Controlled Word Association Test, Logical Memory test. • Adequate concurrent validity with FIM (whereas same study showed poor concurrent validity of the MMSE and FIM) (*geriatric stroke*).	• Takes a little longer than MMSE or MoCA. • No psychometric studies involving younger adults or adults with acquired brain injury or mental illness. • Lacks sensitivity to mild cognitive impairment. • Similar issues as MMSE in terms of interpretation of results – including that cut-off scores are not 100% accurate (sensitive), and interpretation must take into consideration factors such as age, education, & culture.
Montreal Cognitive Assessment (MoCA) Screening assessment; Impairment level *(global)* **Population** ☒ Acquired brain injury ☒ Traumatic brain injury ☒ Stroke ☒ Mild cognitive impairment ☒ Older adults ☒ Dementia ☒ Other (e.g. Parkinson's Disease, Multiple Sclerosis, Huntington's Disease, etc.) www.mocatest.org	A screen initially designed to "…to assist first-line physicians in detection of mild cognitive impairment…" (Nasreddine 2005, p. 695). Includes screen for visuospatial/executive, naming, memory (recall), attention, language, abstraction and orientation domains. ***MoCA training and certification***: available since 2018; mandatory since Sept 1, 2019 with deadline of Sept 1, 2020 for access to the test ($125USD, valid for 2 years). *If cost prohibitive then consider other cognitive screening options available that will assist in addressing the purpose of your assessment*. Many different versions, for example: • Most current paper version (as of 2020): v 8.1 • Alternate versions. Recommened to use v. 7.2 and 7.3 if needed for re-testing. • Languages: Many languages, including some with alternate versions (eg. Mandarin).	**Reliability**: • Excellent internal consistency (*normal elderly, mild cognitive impairment & mild Alzheimer disease*) • Excellent test-retest reliability (*normal elderly, mild cognitive impairment & mild Alzheimer disease*) • Excellent inter-rater reliability for use in telehealth (comparing conditions of in-person vs. online administration and scoring); of interest was that inter-rater agreement decreased for individuals with higher cognitive impairment (*small study, outpatient neuropsychology clinic, DeYoung 2019*) **Predictive Validity:** • Adequate predictive validity of functional status as measured by FIM motor scale and by Modified Barthel Index, with highest correlation between these measures and the MoCA visuo-executive items – highlighting the importance of executive function skills in terms of functional outcomes (*subacute stroke*). • Another study indicated no predictive value in predicting FIM scores (*geriatric assessment program*). • Poor predictor of supervision needs (independent vs. needing supervision) upon discharge – thus	**Virtual Health/Telehealth** • See website: https://www.mocatest.org/faq/ • Video/telehealth platform (e.g. Skype, Facetime, Teleconference): modified instructions are available on MoCA website. • By phone: consider whether or not the Blind version might be appropriate for your use. • Paper version via telehealth: results may be less accurate when administered to individuals with higher cognitive impairment (DeYoung 2019) and for attention domain (Chapman, 2019). A complex set-up may be required, e.g. a study using Zoom required the client to have a 2nd webcam (directed at tabletop) and an envelope provided ahead of time with visuospatial/executive and naming items (Chapman, 2019); another study emailed these items just prior to testing and required the client to print them (Abdolahi, 2016). • eMoca (i.e., use of App): client's lack of experience using iPad may affect MoCA score (Wallace et al., 2019). **Pros** • Score sheets, instructions, and lots of information available on web site (score sheets, instructions,

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
	• Short-form (multiple versions published). *Caution*: be explicit about the content when providing results (McDicken et al, 2019). • Electronic (eMoCA). Only for iPad/iPad pro, available by subscription ($10USD/mos) through the MoCA website. *Caution*: be aware of client's experience using a touchscreen, because lack of experience may result in lower MoCA score (Wallace et al., 2019). **Time to administer:** 10 minutes (paper version, in person) **Scoring:** • Maximum 30. Add 1 point if education is ≤12 years (to compensate for eduation bias). A score of 26-30 is generally considered normal (thus, <26 is generally considered cognitively impaired). • Note re: education bias: Johns (2008) recommended adding 2 points if 4-9 years of education or 1 point if 10-12 years, but such recommendations have not been applied to standardized interpretation of scores. • Note re: cut-off score: A 2011 study (Godefroy et al.) suggests cut-off score be adjusted, with <23 representing cognitive impairment for literate adults aged <80 years – but the original scoring continues to be presented on the MoCA website. • Note re: cultural bias: The cut-off score may need to be lowered where a culturally adapted version has not been developed, for example one study based in South Africa recommends lowering to 24 (Beath et al., 2019) **Minimal Clinical Difference (MCD)**: For healthy adults age 55 and older, a score would need to change at least 4 to 5 points (and possibly -6 to +8 points) for the assessor to be confident that the change is not due to measurement error (Feeney et al, 2014; Kopecek et al., 2016). For an ABI study (stroke and TBI) it was determined that the reliable change indice for a confidence interval of 80% is -2 to +4 (Lim et al, 2016).	needs to be combined with a functional assessment to increase predictive value of the overall evaluation of the client (*stroke & TBI*). • Poor sensitivity (57%) and specificity (69%) of a score of <18/30 predicting d/c from a seniors rehab program to a nursing home (*Emerson 2019*). • Poor predictor of functional outcomes (*for 1-year post aneurysmal subarachnoid hemorrhage in Hong Kong Chinese patients*). • Did not identify individuals who might experience problems in daily functioning after mild stroke. • Did not predict discharge destination for acute stroke (whereas lower age + higher Barthel Index score were predictive; adding MoCA score did not contribute significantly to this model). • Lower scores on MoCA (<20/30) are more likely to predict task performance (as measured by EFPT) at time of discharge than higher scores (*acute stroke*) – thus, if MoCA is ≥20, other functional performance measures need to be administered to confirm functional abilities. • Lower scores on MoCA (<18/30) are more likely to predict on-road driving safety, and therefore should raise concerns/identify need for an assessment of driver fitness. The most useful scores in informing driving ability appear to be attention and visuospatial/executive domains (Ma'u & Cheung, 2020). **Group Differences:** • Differentiates between healthy controls and numerous populations. **Other Aspects of Validity:** • Adequate correlation between MoCA and Activities of Daily Living Questionnaire (ADL-Q) for outpatients with neurodegenerative disease. • Found to be more sensitive than the MMSE in detecting cognitive impairment (*e.g., normal elderly, mild cognitive impairment & mild Alzheimer disease; stroke; Huntington's disease*). • Adequate criterion-related validity with RBANS (Beath 2018). • Small to moderate sensitivity for monitoring cognitive change in early Alzheimer disease • The eMoCA has excellent convergent validity with the standard version (v. 7.1). (*Outpatient memory clinic, age range 47–89, mean age 71.6*) (Berg et al., 2018)	references) – but as of Sept 1, 2020 at a cost (see Cons). • Quick screen. • More sensitive than SMMSE in identifying mild cognitive impairment. • Includes some executive function items. • Available in many languages. • For English version: 3 versions thus allows re-test. • Recommended by BC Ministry of Health to assist in diagnosis for cognitive impairment of elderly & endorsed by VCH and PHA. • Capable of detecting change over time (but beware that there may need to be a decline of >2 or improvement of >4 points to be a reliable measure of change, as per recent ABI study). **Cons** • Cost: As of Dec. 1, 2020, training & certification is required ($125USD) to access the test. • This is simply a screen for mild cognitive impairment; it is not otherwise a measure of the degree of cognitive impairment. • On its own, the MoCA is not a very good predictor of function (must combine with functional testing) as shown in multiple studies – although higher scores for the visuo-executive items do correlate with higher functional outcomes (subacute stroke). • Conventional use of the MoCA as a screening tool to detect MCI may be problematic in cultures different from that in which the cut-off score was determined. • Need to use caution when applying cut-off score in lower education or ethnically diverse populations.
The Repeatable Battery for the Assessment of Neuro-psychological Status (RBANS)	This is a brief neuropsychological battery that consists of 12 subtests that provide for 5 index scores (and a Total Scale score): immediate and delayed memory, attention, language (picture naming, semantic fluency), and visuospatial/constructional skills. It contains a	**Reliability**: • Generally adequate internal consistency for each index score and total scale (*brain injury outpatients*) • Adequate test-retest reliability (using alternate versions) (*healthy controls*)	**Virtual Health:** Scoring options: Q-interactive® Web-based Administration and Scoring or Manual Scoring (search Pearson Assessments website for details) **Pros**:

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Now sold as: **RBANS Update (2012)** Screening assessment; Impairment level **Population** ☒ Acquired brain injury ☒ Dementia (*primary pop'n*) ☒ Schizophrenia ☒ Other: may be a better choice than MMSE for adults who have low education and/or are illiterate (*Goudsmit, 2018*) ***Norms**: Age 12 to 89 years. The norms in the manual are based on United States population normative standardization (and can be applied to various dementias, Huntington's disease, Parkinson's disease, depression, schizophrenia, and traumatic brain injury).* *Subsequent publications have examined performance for a variety of populations including other languages, and for specific populations (e.g., Iverson et al., 2009, norms for schizophrenia). Not all of these papers are listed in reference section of this Inventory.* *A recent paper about norms addresses age 60–93 years (Olaithe, 2018).* https://www.pearsonclinical.com/psychology/products/100000726/repeatable-battery-for-the-assessment-of-neuropsychological-status-update-rbans-update.html	number of subtests that were drawn from various neuropsychology tests such as WAIS-III, Boston Naming Test, etc. It was developed for 2 purposes: • as a stand-alone, core battery for detection and neurocognitive characterization of dementia; • to detect and track neurocognitive deficits (and recovery) in a variety of disorders. There are 4 equivalent alternate (parallel) forms, thus allowing for retesting. Recently an attempt was made to determine a measure of executive functioning by calculating some of the errors thought to represent "executive errors", resulting in the RBANS EE score (see Scoring below). **Time to administer**: about 30 minutes (thus, provides an extended screening assessment). **Scoring**: (See also Cautions below). The raw scores for the 12 subtests are scaled together to create 5 index scores, which are then summed to convert to a total scale score. As per the test booklet, computation of scores takes <5 minutes. RBANS EE score: calculate the sum of errors made during the list learning and recall, semantic fluency, and coding, then divide by the sum or total responses (errors and correct responses) for these subtests (Spencer et al 2018). Cautions: • This isn't a good assessment for use with mild cognitive impairment (it's not sensitive enough) (e.g. Arch & Ferraro 2019: individuals with MTBI might only show difficulties on the Delayed Memory Index). • The subtest data should not be used as "stand-alone" measures, but only to help interpret the index (total) score performance. • Do not rely on a single source of information such as the RBANS retest scores to conclude that there has been a significant change in the client's neurocognitive status. • Significant caution is warranted when interpreting "Effort Index" (EI) results (e.g. Goette 2019; Williams 2020). • For stroke, Green (2013) recommends using a cut-off of <70 as "highly likely to have cognitive impairment" and between 70-80 as	• Excellent test-retest reliability (using alternate versions) (*schizophrenia*) **Predictive Validity:** • Linear regression analyses showed that the RBANS index scores predicted results of the 6 domains of the "CDR scale", a semi-structured interview of patients & informants (domains = memory, orientation, judgment & problem solving, community affairs, home & hobbies, and personal care) – in particular for the language and immediate memory subtests (*for individuals with dementia or mild cognitive impairment*) • Across studies there are inconsistent results in terms of the RBANS's predictive validity of occupational status (i.e., working or not working) post schizophrenia. **Group Differences:** • Differentiates between older adults who may have illnesses associated with aging but no cognitive impairment, and adults with dementia. • Poor sensitivity in differentiating between adults with mild cognitive impairment (MCI) and cognitively intact peers (it differentiated only for about 50% of the subtests and index scores). • Differentiates between healthy adult controls and: -adults with bipolar disorder -adults with schizophrenia -adults post-stroke • Differentiates between healthy adolescents and adolescents with psychotic disorders. • Similar to better ability as compared to MMSE in discriminating between older adults with intact cognition and those with MCI and dementia. Note: education and literacy were correlated with MMSE results but not with RUDAS (thus, level of education and literacy do not impact results of RUDAS as much as they impact MMSE, and therefore it's a better choice for individuals who are poorly educated and illiterate). (Goudsmit 2018). **Other Aspects of Validity:** • Concurrent validity with neuropsychological tests: - Adequate to excellent concurrent validity for most subtests and the index scores, in comparing to neuropsych tests measuring similar cognitive constructs (*brain injury inpatients and outpatients*). - Adequate to excellent concurrent validity for the RBANS Language Index in comparing various neuropsych indices specific to language skills (*diverse neurological etiologies*). • Concurrent validity with MMSE: excellent concurrent validity when the Total Scale score is compared to total MMSE score (*individuals referred for dementia assessment*).	• This is a "neuropsych" style test that OTs can use (i.e. without needing to be a psychologist), but be aware that there is poor predictive validity for function/ occupation. • Fairly quick to administer (30 min), and can be done at bedside, no major set-up required. • Administration and scoring gets easier as you learn/practice using it. • Strong correlation with more extensive neuropsych batteries. • Researchers have found RBANS to be more suitable than MMSE for detecting and tracking mild cognitive impairment (MCI) presumed to be due to dementia/ Alzheimer disease – although see Cons (below) on this issue. • May be useful in reducing amount of testing administered to a client by providing a relatively quick screen without administering a full neuropsych test battery (depending on factors such as purpose of assessment). • A study suggests that the RBANS is sensitive to the neuropsychological deficits typically found in depression (although it's not a full validity study) (Faust et al 2017). **Cons**: • For OTs: be aware that the RBANS is a poor predictor of function/ occupation. • RBANS does not measure executive functioning (EF) very well, although the new RBANS EE score proposed by Spencer et al (2018) may detect individuals requiring further assessment of EF. • Expensive, in particular to purchase the full kit (with all 4 versions): $699.00 USD. Less expensive for only 1 version: $290.00. Cost of additional forms: $120.00 for 25 (per version). • A primary disadvantage when specifically compared to the MMSE is the administration time (30 min vs. 5-10 min). • Although RBANS is better than MMSE in detecting MCI, the diagnostic accuracy for MCI is significantly increased with more in-depth assessment, i.e. by including neuropsych tests that assess similar constructs as RBANS (Heyanka, 2015). • If administering RBANS as a screening where there is follow-up using neuropsych tests, be careful that the neuropsych memory measures are not administered in same testing session as the RBANS because there is the potential of interference effects (Calamia 2017.) • Cannot use the language component with non-English speakers. • Difficult to understand/interpret results without having a good knowledge of the concepts of statistical significance, bell curve, etc. • Research indicates that it does not necessarily have high specificity for cognitive impairment for individuals with schizophrenia or brain injury (being

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
	"likely to have a cognitive impairment". Those who score >80 should be assessed on more detailed neuropsych tests before concluding that there is no cognitive impairment present. • The RBANS EE score represents only a few of the types of errors that a person with executive dysfunction may make, and does not provide a comprehensive measure of executive functioning (EF), certainly not from a functional perspective – although it may identify clients who require further assessment of EF. **Minimal Clinically Important Difference (MCID)**: One study presents MCID as determined with a sample of ethnic Chinese, older adults (Phillips 2015); however, another study cautions use of the MCID approach for the RBANS (see O'Connell et al., 2017).	• RBANS EE score: poor to adequate concurrent validity in comparing the EE score with a number of neuropsych tests that aim to measure executive functioning (e.g. Trails B, Tower of London moves, Wisconsin Card sorting, etc.) (*veterans with variety of diagnoses including dementia, psychiatric illness, and TBI).*	that this was developed for assessing dementia, and lacks assessment of "frontal functions").
Rowland Universal Dementia Assessment Scale (RUDAS) Screening assessment; Impairment level **Population** ☒ Dementia ***Norms**: seniors.* https://www.dementia.org.au/resources/rowland-universal-dementia-assessment-scale-rudas	The RUDAS is a short cognitive screening test *specific to dementia* that aims to minimise the impact of the client's culture and language, and has also been found to be useful for adults who are illiterate. The 6 items screen for memory (2 items), body orientation, praxis, drawing, judgement, and cognitive language. Its strongest value is in helping with the diagnosis of dementia and for screening cognitive impairment in older adult populations with cultural and linguistic diversity and/or illiteracy, and not in predicting function. **Time to administer:** 10-20 minutes **Scoring**: Maximum 30. Cut point is 23/30 (a score < 23 indicates cognitive impairment). **Minimal Clinical Difference (MCD)**: *not determined to date*.	Findings from a literature review: "…srong psychometric properties across many population groups who are culturally and linguistically diverse…" (*Komalasari, 2019*) **Reliability**: • Excellent inter-rater and test-retest reliability (community-dwelling elderly, >50% with low education) **Predictive Validity:** • The RUDAS is significantly linked to functional performance as is measured by the FIM for individuals presenting with suspected dementia, but only partially explains the FIM scores. • The cut-off (<23/30) has poor sensitivity (52%) and low specificity (70%) for predicting discharge to a nursing home from a seniors rehab program (*Emerson 2019*). **Group Differences:** • Accurate in identifying individuals with dementia including mild dementia (*seniors at a memory clinic*). **Other Aspects of Validity:** • Excellent convergent validity with MMSE, in the context of one aspect of assessing for dementia (*community-dwelling elderly; and inpatient elderly*). (*Note: A number of articles present studies/ psychometrics for various language/cultural groups such as Danish, Turkish immigrants, Chinese,Thai, Malay, etc. – these were not reviewed or referenced for this Inventory*.)	**Pros**: • Less language-based than MMSE and MoCA, thus much easier to use with an interpreter or with a client with English as second language. • Easily available (at no cost) including forms and *Administration and Scoring Guide*, and online DVD (downloadable) – see link in first column. • The *Administration and Scoring Guide* provides very clear instructions, including as relate to use of an interpreter. • The training required takes little time (20 minutes by video). • Some tasks screen for executive functioning (a major limit to the MMSE). • In general it does not appear to be influenced by language, education, gender, culture: although the "Tips Sheet" (see references) notes some exceptions. • Simple to translate/interpret to other languages. **Cons**: • For OTs: this assessment was developed to assist in the diagnosis of dementia, and does not (cannot) predict function such as for discharge destination. • It only partially predicts function as measured by FIM scores, thus therapists must also use functional measures. "…It is also important to note that many other factors also impact on an individual's occupational function and performance in addition to cognitive skills..." (Joliffe et al., 2015). • Psychometrics are limited to seniors with suspected dementia.

Trail Making Test A & B (TMT)
 	
Screening assessment;
	This is a screening test of visual attention, working memory and task-switching/mental flexibility. Trail making tests are typically part of a neuropsych battery. A variation of TMT B is included as part of the MoCA. Trail making	**Reliability**:
		• Excellent inter-rater reliability (*population unknown*).
		• TMT A and B: excellent test-retest reliability (*major depression*) – but studies caution practice effects.
			Virtual health:
			• Cautions with use of iPad version (*Bracken et al, 2019*):
			  • left-handed healthy adults performed slower
			  • poor psychometrics

Screening *Impairment Level*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)

Impairment level *(working memory, visual attention, cognitive flexibility)*
 	
Population
☒ Acquired brain injury
☒ Dementia
☒ Mental Illness
 	
***Norms**: Sources include Tombaugh (2004). Also available for age 85+ based on cognitively intact Swedes (Fällman 2020).*
 	
Trail-Making A and B: easy to access on internet (search for Trail Making Test)
 	
Comprehensive Trail Making Test (CTMT): https://www.parinc.com/Products/Pkey/6523
 	
Color Trails Test (CTT): https://www.parinc.com/Products/Pkey/77
	tests may be seen included as part of a pre-driver screen battery.
	
	Versions:
	• Trail Making A and B (TMT A and B): pencil and paper-tests where the client is required to connect numbers (A) or numbers and letters (B). (*see Bowie & Harvey, 2006, for detailed instructions*)
	• Comprehensive Trail Making (CTMT): developed to improve upon TMT A and B. There are 5 trails tests based on TMT A and B, some which include distracters. There is a large norm sample of 1,664 (age 8-74, with demographics matched to US Census).
	• Color Trails Test (CTT-1 and CTT-2) and Children's Color Trails Test (CCTT).
	• Other:
	  • An eye-tracking version is available (Hicks et al., 2013), which has good correlation for speed with TMT B.
	  • Attempts have also been made to develop an oral version (OTMT-A, OTMT-B), but a review paper advises caution in administering and interpreting the oral TMT (Kaemmerer & Riordan, 2016).
	  • iPad version was developed in 2013 (but caution as per Bracken et al, 2019 – *see virtual health notes in final column*).
	
	Versions and/or normative data are also available for other languages/countries, for example Spanish-speaking, Chinese-speaking, Australia, Turkey, etc. (*references not included in this Inventory*)
	
	Time to administer: 5-15 minutes, depending on version used.
	
	Scoring: simple scoring. Don't use original cut-off scores because age and education affect the scores; instead, use the 2004 norm data available on-line (see Reference List).
	
	A systematic review (Mononita & Molnar, 2013) reveals that for the Trails B, a cut-off of 3 minutes or 3 errors represents the best evidence-informed cut-off available to date.
	
	Minimal Clinical Difference (MCD): Cannot use for test-retest due to practice effects. Do not use alternate versions (e.g. TMT, CTT) as test-retest.
		• CTM: excellent internal consistency, adequate test-retest reliability.
		• iPad-TMT test-retest reliability: considered not adequate for TMT A (poor to adequate across groups) and adequate for TMT B (poor to excellent across groups) (*healthy adults*). (Bracken 2019)
		
		Predictive Validity:
		• Construct validity: a battery of neuropsych tests (including TMT) was found to be associated with functional outcomes (with 37% of variance shared) (*schizophrenia*)
		• Specific to fitness to drive:
		  • A systematic review indicates methodological limitations in research studies that aim to determine clinically useful cut-off scores in determining fitness to drive (Roy & Molnar, 2013).
		  • Subsequent studies provide mixed results in terms of TMT's ability to predict fitness to drive; the general findings are that the TMT is not specific enought for clinicians to justify driving cessation without other evaluations (Vaucher et al., 2014), although it may be helpful as a screen or part of a screen (e.g., Papandonatos et al., 2015; Choi et al., 2016). A recent study found that Trails A&B scores did not inform driving ability (Ma'u & Cheung, 2020).
		
		Group Differences:
		• Sensitive to normal age-related declines in cognition.
		• Differentiates between individuals with Parkinson's disease and healthy controls.
		• One study found no significant difference on TMT-B between individuals with and without frontal dysfunction.
		• CTMT: adequate concurrent validity with other neuropsych tests.
		
		Other Aspects of Validity:
		• Construct validity: TMT-A requires mainly visuoperceptual abilities and TMT-B reflects primarily working memory and task-switching ability, in correlating with other neuropsych measures (*healthy subjects*).
		• Construct validity: TMT A and B measure cognitive impairment as supported by poor to excellent concurrent validity with other variations of trail-making tests (college students).
		• Excellent concurrent validity of OTMT-B with TMT-B, but poor concurrent validity of OTMT-A with TMT-A (healthy adults).
		• Concurrent validity of iPad-TMT and original: adequate for part A (but not significant considering poor test-retest reliability) and not adequate for part B.
			• *"Clinicians should use caution when using electronic versions of traditional tests, as they may assess different constructs. New norms should be developed."*
			
			Pros:
			• Simple, quick.
			• Easy to access forms for TMT A and B on-line at not cost.
			• There is a cost for other versions (including CTMT and CTT) although it's a fairly low cost. However, only Level C assessors can order these versions (e.g psychologists) (see links in Column 1).
			
			Cons:
			• Be cautious in drawing conclusions from performance of TMT-B to detect frontal executive dysfunction.
			• For clinical populations, there is very little research to date associating TMT results with measures of everyday function including driving – the best evidence is for neuropsych batteries that include TMT, and not a TMT on its own.
			• Cannot use for re-testing due to practice effects.
			• TMT and CTT may not be equivalent – so do not use as alternative versions for test-retest.
			• Be careful what norms are used (depends on part what test is used – TMT, CTMT, CTT, OTMT). Norms of TMT A and B may no longer be applicable to current US population (the CTMT was developed to overcome this and other limitations).
			• Requires the client to have knowledge of the numbers and letters used in the English language.
			• As above, CTT and CTMT are available only to Level C assessors (i.e. psychologists).

II. SCREENING (*TASK PERFORMANCE*):

Screening *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Kettle Test Screening assessment; Task performance level **Population** ☒ Stroke ☒ Older adults (including subacute geriatric rehab) ☒ Other: suspected cognitive impairment Manual: https://www.sralab.org/rehabilitation-measures/kettle-test	Aims to evaluate the ability for independent community living of people with identified or suspected cognitive disabilities. Screens for many different cognitive areas (including memory, executive functions) – but the score is based on cueing required, not specific cognitive performance. The client prepares 2 cups of hot beverage, one for self and one for clinician, with complexities in the task relating to type of hot drink selected by evaluator; electric kettle not being assembled; extra items on display not being required in the task; etc. **Time to administer**: approx 20 minutes **Scoring**: Score the cueing required for each of 13 steps of the task. Total score = 0-52, with higher score representing higher need for cueing (more problems in performance). Information from the authors also allows the client's performance to be categorized as independent, mild assist required, or significant assist required. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability**: • Excellent inter-rater reliability (geriatric stroke). • *Note: the authors of the test feel that test-retest reliability is irrelevant/does not apply because the test incorporates an element of novel problem solving, thus it is expected that the client would improve on re-test.* **Predictive Validity:** • When used together with the MoCA, there is an improved prediction of the person's need for supervision upon discharge, as compared to using MoCA alone (but still fairly low predictive value even using these tests together) (*stroke & TBI*). • Kettle is stronger than MMSE or cog-FIM in predicting patient functional outcomes (as measured by m-FIM) (*subacute rehab*). **Group Differences:** • Differentiates between healthy controls and stroke at discharge from rehabilitation. **Other Aspects of Validity:** • Adequate convergent validity in comparing to a battery of cognitive tests (*older adults with suspected cognitive deficits; stroke; subacute rehab*). • Adequate to excellent convergent validity (also considered "ecological validity") in comparing to tests of ADLs and IADLs (*older adults with suspected cognitive deficits; stroke*).	**Pros**: • Ecological validity, portable, assesses functional performance. • Fairly quick to administer; provides a score of cognition through use of a functional task. • VCH has developed a user-friendly instruction and scoring form. • When used together with MoCA test, can improve OT's capacity to predict discharge needs in terms of supervision required at home – but still the OT must consider other information gathered in assessment, and not depend solely on these 2 scores. • Is recommended for assessment of executive functions in a published inventory of tests of executive function for stroke – as having high clinical utility because it takes less than 20 minutes (Poulin et al, 2013). • Although there have been no updates since 2005, the tasks continue to be ecologically valid (i.e., are not outdated). **Cons**: • No cost to access test manual, but the OT/clinic needs to purchase and assemble all materials (kettle, drink items etc.) ahead of time; and replace some materials just prior to assessing client (e.g., milk).
Executive Function Route- Finding Task (EFRT) Screening assessment; Task performance level *(executive functions)* **Population** ☒ Traumatic brain injury ☒ Mild cognitive impairment	A performance-based screen of executive functioning relating to route-finding: task formation, strategy approach, detection & correction of errors, dependence on cueing. **Scoring**: 1- to 4-point scale for each of: ○ Task Understanding ○ Information-seeking ○ Retaining directions ○ Error detection ○ Error correction ○ On-task behaviour (the higher the score, the fewer the difficulties) The OT can also record potential contributing problems evaluated e.g. visual/perceptual; and overall independence is evaluated. **Minimal Clinical Difference (MCD)**: *not determined to date*	**Reliability**: • Excellent inter-rater reliability (*traumatic brain injury; older adults with mild cognitive impairment*) **Predictive Validity:** • *not determined to date* **Group Differences:** • Differentiates between healthy controls and: - mild cognitive impairment (*MCI*). **Other Aspects of Validity:** • Adequate concurrent validity with some neuropsych tests (verbal comprehension, perceptual organization, flexibility of hypothesis testing), and no correlation with test of speed of information processing (*traumatic brain injury*). • Adequate concurrent validity with 1 of 2 subtests of the EFPT – with "bill payment" but not "telephone use".(*older adults with mild cognitive impairment*). • Adequate concurrent validity with another measure of "everyday cognition" (RBMT) and non-significant correlations with more impairment-based measures (MMSE, block design, vocabulary	**Pros**: • Ecological validity (measure of executive function for task performance) • No cost; information readily available in a published article (Boyd, 1993). • Portable (requires only use of a record to keep track of score, within any environment where OT can plan the route/destination). • VCH has developed a form that provides the reference, all instructions, and scoring. **Cons** • Need to plan ahead for the general route/destination that you will be using for each client (cannot necessarily be the same route for every client).

Screening *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
		scores) (*older adults, some with mild to moderate dementia*). • Adequate correlations between EFRT and other EF assessments (Trail Making A&B, Zoo Map of BADS, and bill-paying from EFPT); but not significantly correlated with ADLs or IADLs (*chronic stroke*). (Lipskaya-Velikovsky, 2018)	

III. IN-DEPTH (*IMPAIRMENT*):

In-Depth ***Impairment***	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Behavioural Assessment of Dysexecutive Syndrome (BADS) *(a version is also available for children: BADS-C. However, no information is contained in this Inventory about it)* In-depth assessment; Impairment level. **Population** ☒ Traumatic brain injury ☒ Stroke ☒ Dementia ☒ Schizophrenia ☒ Other: Parkinson's, multiple sclerosis, substance use ***Norms**: Based on 216 UK healthy controls age 16-87 (details in manual).* https://www.pearsonclinical.ca/en/products/product-master/item-103.html	The BADS aims to assess for "everyday executive impairment". There are 6 subtests (rule shift cards, action program, key search, temporal judgment, zoo map, & modified 6 elements). The test kit also provides a questionnaire, the DEX (Dysexecutive Questionnaire), which is scored separately. **Time to administer**: approx. 40 minutes assuming OT is familiar with the test; plus extra time to score (including conversion from raw to profile to standardized scores). **Scoring**: For each BADS subtest, the raw scores are converted to profile scores (0-4), which are then summed to produce an overall total score (battery profile score, 0-24, which in turn gets converted to a standardized score with a mean of 100). The DEX is not included in the BADS total score; it is scored separately by adding up the individual items. Using the BADS standardized score, follow the manual to provide for an age-controlled classification of executive function performance (based on the normative sample): *impaired*, *borderline*, *low average*, *average*, *high average*, *superior*. **Interpret with caution, because a person may fall into "*average*" even though they did badly on 1 or 2 tests. **Minimal Clinical Difference (MCD)**: not identified (and not likely to be determined because the BADS is not well suited for test-retest – see reliability findings).	**Reliability**: • Excellent inter-rater reliability (r=0.88-1.00 for subtests) (*adults with brain injury*). • Test-retest reliability is not expected to be high, considering that a critical aspect of the test is novelty. However, it has been found to range from poor to excellent (at 3 weeks) for a group of adults with schizophrenia, and poor to adequate (at 6 to 12 mos) for a group of adults with brain injury. • Note: for both groups, participants tended to obtain higher scores on re-administration (may be due to a practice effect including that the test was not so novel the second time; or could possibly show improved function over time). • Adequate internal consistency (α= 0.73) (*schizophrenia*). **Predictive Validity**: • Chronic schizophrenia: BADS found to be a predictor of IADLs (beyond outcomes accounted for by basic cognitive skills). • Traumatic brain injury (TBI): some ability of BADS (total score) to predict executive function for everyday activity (as measured by the DEX), but only if the DEX is administered to a clinician (OT or neuropsych) and not to a family member or client; also, the predictive validity increases if BADS is used together with multiple other neuropsych tests, but still only 46% of variance predicted. • For adults with "higher brain dysfunction" from acquired brain injury: BADS does not predict capacity for competitive employability. • Older adults with dementia: in combination with 5 other cognitive tests the BADS has some predictive validity (67% accuracy all tests. combined) in determining safety for driving. • For chronic alcoholics, BADS was statistically significant in predicting work outcome (whereas 11 other neuropsych tests were not); and for substance dependent adults, predicted everyday problems related to executive dysfunction (whereas Wisconsin Card Sort did not). **Group Differences:** • In one study, did not differentiate between South Asian and White adults (in Canada and USA) thus supports the use of BADS with both these populations (Kallambettu, 2017). • Differentiates between healthy controls and: - schizophrenia (acute & chronic) - mod-sev brain injury - mild Alzheimer disease (but mixed results in studies involving mild cognitive impairment)	**Pros**: • Has been validated with a number of populations. • BADS demonstrates some ecological validity (in terms of predicting everyday function) for: (a) schizophrenia (b) traumatic brain injury, including more so than traditional neuropsych measures of EF – although the predictive validity is improved if multiple modes of assessment are used (e.g. BADS + neuropsych tests + observations) • In addition to providing numerical scores, the BADS can provide useful qualitative (observational) information, e.g. in terms of the efficiency or effectiveness of strategies a person uses (or not) to complete subtests. • DEX appears to be a good measure of EF if administered by a clinician (but not by the client or a relative). • If time is limited, then the DEX (or similar questionnaire) is likely the best measure of executive functioning instead of trying to do BADS subtests (but only if administered by a clinician). **Cons**: • Expensive ($871.50 CAD; plus $72.25 for 25 extra package of scoring sheets, and $56.25 for extra package of DEX questionnaires). • Even though BADS is comprehensive, on its own it still does not provide a full picture of executive functions (at least for dementia and TBI); instead, multiple ways of assessment (i.e., battery of tests + qualitative information) need to be used. • Avoid doing just some of the BADS subtests in an effort to save time because the full BADS test score (or at least 5/6 subtests as per test manual) is needed for validity findings to apply. (Although, as per above, the therapist-rated DEX may be useful on its own if administered by a clinician who knows the client). • Based on test-retest reliability data, this test is not very suitable for using as a measure of change over time (because there may be a practice effect including that the test is not so novel the second time). • Socio-cultural background may have some influence on results (no influence comparing Japanese with British adults with schizophrenia; but differences between different American cultural/language groups for healthy controls).

In-Depth *Impairment*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
		- chronic alcoholics - substance dependency • For early Alzheimer disease and non-demented Parkinson's disease, group differences between healthy controls did not show up for all subtests, but showed for total BADS score. • Differentiates between MCI and early Alzheimer's; and between chronic alcoholics and Korsokoff's (thus, sensitive to progression of cognitive impairment). • One study indicated that the BADS does not do a good job at differentiating between younger and older adults; but another study (in manual) shows significantly poorer performance overall for subjects older than 65. • The DEX differentiates between individuals with brain injury and healthy controls, but only the therapist ratings and not the self-ratings (thus reflecting poor insight in patients). **Other Validity**: • Some studies show normal performance in some subtests (thus, all subtests should be administered, resulting in the full battery profile score) (*schizophrenia*). • Appears to best assess planning and problem solving aspects of EF (*chronic schizophrenia and mod-severe brain injury*). • Adequate correlations between Zoo Map and other EF assessments (Trail Making A&B, EFRT, and bill-paying from EFPT); and ADLs but not IADLs (*chronic stroke*). (Lipskaya-Velikovsky, 2018) • Mixed results in terms of showing a correlation between BADS subtests and other neuropsych tests of executive function (e.g., Tower of London - TOL, and Modified Card Sorting Test ; with TOL showing the least sensitivity to executive deficits in at least 2 studies). • Convergent validity: adequate convergence (r=0.36-0.59) with neuropsych tests purporting to measure executive functioning (*schizophrenia*). • Adequate correlation between BADS and daily life functioning (measured using Life Skills Profile) (*schizophrenia*). • Specific to DEX: - Factor analysis shows that 3 aspects of EF are measured: behaviour, cognition, and emotion. - As per manual, subjects with brain injury tend to underrate themselves as compared to others. - As per manual, poor to excellent concurrent validity with neuropsych tests of executive functioning and also with BADS total score (with highest correlation being with BADS total score) – but only if DEX is rated by others. No concurrent validity if DEX is rated by clients (*brain injury*). - As per other studies, when comparing results of the DEX and BADS, if the DEX was completed	

In-Depth *Impairment*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
		by the client, caregiver or family, then it is not sensitive to EF performance (as measured by BADS) (chronic schizophrenia, brain injury, multiple sclerosis). However, if DEX is completed by a clinician (e.g. psych, OT) who works with the client, then it is sensitive to EF as measured by BADS (*brain injury*).	
Butt Non-Verbal Reasoning Test (BNVR) In-depth assessment; Impairment level **Population** ☒ Stroke (with aphasia) ***Norms**: based on 84 community living (UK) healthy controls and 93 people with CVA with difficulties initiating communication, ages 34-95.* https://www.routledge.com/BNVR-The-Butt-Non-Verbal-Reasoning-Test-The-Butt-Non-Verbal-Reasoning/Butt-Bucks/p/book/9780863884726	This is a standardized measure of problem-solving (reasoning) abilities for individuals with aphasia post stroke. It is suggested that it is most useful in the acute (<6 months post CVA) stage to inform strategy use and interventions. **It does not comprise a full cognitive screen. The test consists of 1 practice photograph (scenario) to ensure the person has the perceptual skills required; and 10 test photographs of people with everyday problems. The client solves these problems by selecting from 4 smaller photos of object, one of which is the solution to the problem depicted in the larger photo. These 4 small photos include the target response, a visual distracter, a semantic distracter and an unrelated distracter, to help the evaluator identify any specific pattern of types of errors (if any). **Time to administer**: not stated in manual but approximately 15 minutes. **Scoring**: scored out of a possible 10 correct responses. Three error responses can be obtained to identify visual errors, semantic errors and unrelated errors which can inform further assessment and intervention. **Minimal Clinical Difference (MCD)**: not determined to date.	**Reliability**: • Good test-retest and inter-rater reliability (27 participants with CVA age 52-90, 19 male, 8 female). **Predictive Validity:** • Not researched to date. **Group Differences:** • Differentiates between healthy controls and adults with CVA. **Other Aspects of Validity**: • Poor to adequate concurrent validity with the Pyramids and Palm Trees Test and the Spoken Word to Picture Matching Test (correlations ranged from 0.27-0.44). Errors on these tests account for less than 20% of the variance in BNVR error performance indicating that the BNVR is measuring some aspect of semantic processing which is additional or different to these other 2 tests.	**Pros**: • Discriminates between healthy controls and people with CVA. • Appears sensitive to change. • Quick to administer and score. • Aimed at stroke patients with aphasia. • May guide further assessment and intervention. • Cost (consisting of a test manual) is not too prohibitive (approx. $150.00 CAD). **Cons**: • Does NOT comprise a full cognitive screen: the focus is on problem-solving (reasoning) abilities – thus needs to be used in conjunction with other assessment methods/tools to screen other aspects of cognition (such as memory). • No further research since 2004, including to correlate test results with functional measures. • Testing for cultural sensitivity is needed. • No MCD available (thus it's difficult to measure if there is a significant clinical change over time on re-test). • The problem-solving scenarios in the test are quite concrete and generally with one primary solution; whereas in real life many problems are more complex with more than one possible solution – thus the BNRT does not assess higher-level problem solving/reasoning.
Contextual Memory Test (CMT) and CMT-2 (web-based) In-depth assessment; Impairment level *(contextual memory)* **Population** ☒ Acquired brain injury ☒ Traumatic brain injury ☒ Stroke ☒ Dementia ☒ Other: Parkinson's, multiple sclerosis, AIDS, epilepsy, chronic alcohol abuse.	The CMT assesses awareness of memory capacity, use of strategy, and memory recall in adults with memory dysfunction. It can be used as a screen to determine the need for further evaluation or to indicate how responsive the individual is to memory cues to recommend compensatory or remedial treatment. There are 2 parallel forms: Morning version and Restaurant version. As of 2020, there is no longer a paper version available to purchase; instead there is an on-line version (currently a pilot and at no cost to therapists who register for access). *As of early 2020 there is only an on-line version currently available (in a pilot phase), but the website indicates that a paper version will soon be available.*	**Reliability**: • Adequate to excellent reliability for parallel form (*brain injury*). • Adequate to excellent test-retest, using immediate recall and delayed recall scores (*healthy adults, brain injury*). **Predictive Validity:** • *not determined to date* **Group Differences:** • Differentiates between healthy controls and: - Alzheimer disease - brain injury **Other Aspects of Validity:** • Excellent concurrent validity with the Rivermead Behavioral Memory Test (*brain injury*).	**Pros**: • Asks about strategies thus aids in planning intervention. • Option of contextual prompt. • Flexible testing procedures – recall vs recognition. • Uses pictures of everyday objects. • Easy to transport. • Early 2020 update: new web-based version (CMT-2) is available at no cost (while in a pilot phase) **Cons**: • The focus is limited to assessment of contextual memory. • Early 2020: paper version not currently available to obtain/purchase, but website indicates it will soon be available. • Scoring is confusing and lengthy. • Not appropriate for individuals with moderate or severe aphasia or visual perceptual deficits.

In-Depth *Impairment*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
***Norms**: 3 age groups, based on 375 healthy adults aged 17-86.* https://multicontext.net/contextual-memory-test	**Time to administer:** Requires 5-10 minutes, in addition to the 15-20 minute delayed task. **Scoring**: The test yields three recall scores (immediate, delayed and total), and scores for cued recall, recognition, awareness and strategy use. Scores are compared to the norms and then analyzed for patterns using the Summary of Findings worksheet. Recall scores are classified into categories of WNL, suspect, mild, moderate or severe deficit. **Minimal Clinical Difference (MCD)**: *not determined to date*.		• Ceiling effect – may not identify clients with subtle memory deficits. • Normative data focused on Caucasian, highly educated young population (although results were replicated for the most part with an Israeli population). • Limited research findings.
Dynamic Assessment of Categorization (Toglia Category Assessment – TCA) In-depth assessment; Impairment level *(cognitive flexibility, develop strategies)* **Population** ☒ Acquired brain injury ☒ Schizophrenia: chronic http://www.erp.ca/Toglia-Category-Assessment-ERP1818.html	A very specific test that examines the ability to establish categories and switch conceptual set and deductive reasoning. Emphasizes qualitative aspects of performance, and is based on Toglia's dynamic interaction principles of testing. The evaluee needs to be able to follow two-step directions, discriminate between size, color and form, and attend to a task for a minimum of 15 minutes. **Time to administer:** 10-30 minutes **Scoring:** Standardized test score sheet is used. Scores range from 1 (unable to sort after reduction of amount) to 11 (independent sort, no cues given). Provides a total score plus 3 sub-test scores: sort by colour, type, and size. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability:** • Adequate to excellent internal consistency (*stroke, traumatic brain injury, inpatients with schizophrenia*). • Excellent inter-rater reliability (*stroke, traumatic brain injury, inpatients with schizophrenia*). **Predictive Validity:** • Adequate validity for predicting IADL tasks (*acquired brain injury on acute neurosurgery unit*). **Group Differences:** • Differentiates between healthy controls and brain injury. **Other Aspects of Validity:** • Adequate concurrent validity with the Risks Object Classification Test (*stroke, traumatic brain injury, inpatients with schizophrenia*).	**Pros**: • Portable; can be used at bedside. • Short time to administer. • Uses familiar items (i.e., in terms of the objects to be categorized). • Links assessment results with treatment planning (in particular, developing strategy use). • Deductive reasoning test may be used to demonstrate the potential for change or learning. • Deductive reasoning test can be used as a re-assessment tool. **Cons**: • Scoring is rather lengthy and may not provide very useful information as applied to assessment of cognition or function. • Fairly reasonable cost ($139.00) but might be going out of stock (and this is for simple items and score sheets). • Lacks recent research. • Requires use of language skills thus cannot be used for individuals with moderate to severe aphasia. • May not be applicable to populations other than acquired brain injury or chronic schizophrenia. • Cannot be used to measure change over time.
Rivermead Behavioural Memory Test (RBMT) ***the versions most likely to be in use: RBMT-2 (2003), RMBT-3 (2008)* *(There is also a version for children: RBMT-C.)* In-depth assessment; Impairment level *(memory)* **Population** ☒ Acquired brain injury ☒ Traumatic brain injury ☒ Stroke	This is an assessment of memory related to functional tasks. Assesses visual, verbal, recall, recognition, immediate, delayed and prospective memory, & ability to learn new info. RBMT-3 adds "novel task". **Time to administer:** 30-40 minutes **Scoring**: RBMT-2: Screening score (max 12) or standardized profile score (SPS) (max 24) RMBT-3: Sum scaled score can be used to calculate a General Memory Index, Percentile Rank, and Confidence Interval.	**Reliability**: • Adequate parallel form reliability (*mixed sample of healthy adults and "clinical cases"*). • Excellent inter-rater reliability (*mixed sample of healthy adults and "clinical cases"*) **Predictive Validity:** • *no studies to date* **Group Differences:** • differentiates between healthy controls and: - brain injury (RBMT and RBMT-3) - Korsakoff's Syndrome /chronic alcoholics (RBMT-3) • differentiates between healthy controls, mild cognitive impairment, and Alzheimer disease (RBMT)	**Pros**: • Allows comparison to norms. • Results (strengths/weaknesses for memory) allow the OT to provide more specific and individualized memory strategies. • Results are useful to include in an education session for family members. • Modest ability to predict everyday memory failures. • Parallel versions (RBMT-3) allow for test-retest (thus, evaluation of change over time). • Ecological validity is supported through use of some "task performance" elements and concurrent validity with therapists' and relatives' ratings of individuals with brain injury. **Cons**:

In-Depth *Impairment*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
***Norms**: English speaking adults to age 89* https://www.pearsonclinical.ca/en/products/product-master/item-119.html YouTube videos providing description/overview of the RBMT-3: http://www.youtube.com/watch?v=SrGe36ZqpY0 https://www.youtube.com/watch?v=qkcqXuMTfR8	Subtests can be plotted on a Scaled Score Profile. **Minimal Clinical Difference (MCD)**: Not determined to date, but consider that a Standard Error of Measurement (SEM) has been determined: 5.35 for RBMT-1; 5.32 for RBMT-2. Thus, if your client scores within 5 or 6 points of a previous administration, then this might represent measurement error and not a true improvement or deterioration in their performance on the test.	**Other Aspects of Validity:** • Poor to adequate concurrent validity with various impairment-based tests of memory (*brain injury*). • Adequate to excellent concurrent validity between RBMT and therapists' observations of memory failures over a mean of 35 hours, thus evidence of ecological validity (*brain injury*). • Adequate concurrent validity between RBMT and relatives' ratings (*brain injury*). • Adequate concurrent validity between RBMT-3 and proxy rating of the Prospective and Retrospective Memory Questionnaire (*mixed sample of healthy adults and "clinical cases"*). • Adequate concurrent validity for some subtests of RBMT with a test of functional status, the Environmental Status Scale – a broad measure of functional disability (*multiple sclerosis*). • More research is needed on the ecological validity of the RBMT-3 in individuals with alcohol-related memory deficits as well as in other client groups.	• Client needs to have good attention to participate. • Caution in using it with clients who have limited insight about memory changes. • Cost may be prohibitive ($850.00 CAD for complete kit; $160.00 for 25 extra forms). • OT needs to take time to learn how to administer, and become familiar with subtests (including spatial memory task). • Quiet room required (a con if one is not available) • Administration time can be quite lengthy. Despite manual suggesting 30 minutes, it can take up to 50 minutes or longer (especially if OT not very familiar with it). • Does not detect mild memory deficits. • Caution if using with individuals who have limited English abilities (normative group = English speakers).
Symbol Digit Modalities Test (SDMT) In-depth assessment; Impairment level *(attention, visual scanning)* **Population** ☒ Acquired brain injury ☒ Dementia ☒ Schizophrenia ☒ Other: multiple sclerosis; and many other populations ("organic cerebral dysfunction in both children and adults") ***Norms**: Given in various publications (including the manual, 1982; Sheridon, 2006; Drake, 2010 for multiple sclerosis; Fellows, 2019) and including for children and adults age 8 to 78, categorized for age groups and gender. Also available for age 85+ based on cognitively intact Swedes (Fällman 2020).* http://www4.parinc.com/Products/Product.aspx?ProductID=SDMT	The SDMT was developed to identify/detect cerebral dysfunction in children and adults ages (age 8 plus) – assessing processing speed, attention, visual scanning, and (if a written response is required) motor speed. The client is presented with a series of geometric figures and, with reference to a key, indicates which geometric figure matches which number (from 1 to 9). The client can provide written or spoken responses. This test is optimally not used on its own, but as part of a battery of cognitive (neuropsych) tests. There is a written version and oral version. Versions: • Alternate forms developed for use by researchers to try to eliminate practice effect with repeated use (Benedict et al., 2012). • C-SDMT: Computerized version, initially developed to be used during fMRI research. • T-SDMT: tablet version for iPad (Tung, 2016; Hsiao, 2019). This version has a number of changes in the visual presentation to help reduce random errors and practice effect. • Auto-SDMT (in research stages): client can complete without a tester being present (using Window or MacOS-based computer, Google's Chrome browser, and reasonal microphone and speakers) (Patel 2019). Considered the "best, single psychometric option" for use with individuals with Multiple Sclerosis being that nearly 50% of MS population has slowed processing, and it's associated with other cognitive domains such as memory & executive function (Patel 2019).	**Reliability**: • Excellent test-retest reliability for SDMT (*normal controls, schizophrenia*). • Excellent test-retest reliability for c-SDMT (*healthy controls and multiple sclerosis*). • Practice effect shown if administered 1 week apart (*schizophrenia*). • Excellent test-retest reliability using alternative forms of the SDMT (*multiple sclerosis*), • Excellent test-retest reliability for T-SDMT (*outpatient stroke; schizophrenia*). **Predictive Validity:** • (*no studies to date relevant to OTs*) **Group Differences:** • differentiates between healthy controls and: - multiple sclerosis (C-SDMT more sensitive than paper version) - traumatic brain injury - acute stroke - mild cognitive impairment (MCI) - schizophrenia **Other Aspects of Validity:** • As part of a neurobehavioural screening battery, it may help predict post-concussion syndrome (*mild traumatic brain injury*) and may help predict employment status (*multiple sclerosis*). • Adequate concurrent validity with a test of functional status, the Environmental Status Scale, which is a broad measure of functional disability (*multiple sclerosis*). • T-SDMT: excellent concurrent validity with SDMT (*outpatient stroke; schizophrenia*).	**Virtual Health**: potential virtual use: T-SDMT; and other computer-based versions which are currently only in research stages. **Pros**: • May be useful as an initial screen of attention and visual scanning for some populations (*esp. stroke, traumatic brain injury, multiple sclerosis*) – but without prediction of function. • Easy for the client to understand the results, and therefore may be empowering suh as may help the client to develop awareness of cognitive skills. • Can be administered in a group format. **Cons**: • Avoid test-retest, especially as soon as 1 week, owing to potential practice effect. • Recommended to be used as part of a more extensive cognitive battery, thus not likely very useful on its own. • May be perceived by client as a math test and may be off-putting. • Does not provide specifics about functional problems but may provide a place to start. • Relies on visual system which is often compromised e.g. for MS, ABI. Thus, failure on SDMT may reflect impairment in visual processing as well as mental processing speed. • Limited evidence to support SDMT as a predictor of everyday function (although together with other neuropsych tests, may help predict employment status for individuals with multiple sclerosis). • Cost: manual + 25 test forms = $175 USD; extra test forms = $74 USD/package of 25.

In-Depth *Impairment*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
	Recommended for use over the Paced Auditory Serial Addition Test (PASAT) in the Multiple Sclerosis Functional Composite (e.g., Strober, 2018 which compares SDMT and PASAT on many psychometric properties). **Time to administer:** usually 5-10 minutes total (including instructions) with 90 seconds for the actual test. **Scoring:** Scoring is simple (for the pen/paper version use the "autoscore" form). **Minimal Clinical Difference (MCD)**: A 10% change in test performance over time is now considered clinically meaningful (Patel 2019). Be aware of practice effects especially if readministered within a week.	• Auto-SDMT (in research stages): excellent convergent validity with paper-based SDMT (Patel 2019) (*multiple sclerosis*) • Ecological validity: adequate validity was demonstrated for both the SDMT and T-SDMT in comparing with a measure of ADL (the self-report Activities of Daily Living Rating Scale III) (*schizophrenia*). • Predictive validity: adequate association between T-SDMT at admission and Barthel Index scores at discharge thus supporting some predictive validity (Hsiao, 2019) (*stroke inpatient admission*).	
Test of Everyday Attention (TEA) In-depth assessment; Impairment level *(working memory, attention)* **Population** ☒ Acquired brain injury ☒ Dementia ☒ Other: potential use with multiple sclerosis ***Norms***: *a sample of 154 healthy subjects, age 18-80, divided into 4 age ranges (18-34, 35-49, 50-64, 65-80). A 2017 study explores use for adults age 80+ (van der Leeuw et al., 2017)* http://www.pearsonclinical.com/education/products/100000182/test-of-everyday-attention-the-tea.html	The TEA has 8 subtests to measure different aspects of attention. As per the factor analysis these are: visual selective attention/speed; attentional switching; sustained attention; and auditory-verbal working memory. As per the test description in the manual, it also tests for divided attention. There are 3 versions (A, B, C). Note: a children's version is also available (TEA-Ch). **Time to administer:** 45-60 minutes, sometimes as long as 75-90 minutes. Two sessions may be required to ensure sufficient time for repetition of the practice trials. **Scoring:** Score for each subtest: • Option 1: Plot *raw* scores on the tables provided in the manual (appendices) to determine *scaled-score* for each subtest, which depends on client's age range. If *scaled-score* falls within shaded area, then performance is likely abnormal. • Option 2: Use Table 9 in manual to compare the *scaled-score* with a *percentile* range (e.g., *scaled-score* 10 = 43.4th-56.6th *percentile*); or use tables provided in Appendices to convert *raw score* to an approximate *percentile*. *In interpreting scores, the test manual recommends referring to the aspects of attention identified in the factor analysis. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability**: • Adequate to excellent test-retest reliability for subtests, except poor test-retest reliability for the "dual-task decrement subtest" (perhaps due to learning effect?) (*normal adults and stroke*). • Generally adequate to excellent test-retest reliability for subtests except "telephone search while counting", which had poor reliability (*chronic stroke*). **Predictive Validity:** • *not determined to date; see below re: concurrent validity with some functional measures* **Group Differences:** • Differentiates between healthy controls and: - brain injury (in particular the map and telephone search subtests) - stroke • Differentiates between mild cognitive impairment and dementia. **Other Aspects of Validity:** • Adequate concurrent validity (although ranges from poor to excellent for various subtests) with neuropsych measures such as Stroop, PASAT, and SDMT (*healthy controls and traumatic brain injury*) • Adequate concurrent validity with test of functional status, the Environmental Status Scale – a broad measure of functional disability (*multiple sclerosis*). • Poor concurrent validity between some TEA subtests and 3 measures of function (Barthel Index, Extended Activities of Daily Living Scale, Rating Scale of Attentional Behaviour) – although better than some neuropsych tests of attention (Stroop Test, PASAT, backward digit span and others) which did not correlate consistently with these measures of function (*at 2 mos post stroke*).	**Pros**: • There are 3 parallel thus allows for test-retest (although there may be practice effects with the telephone search dual tasks, i.e. the "dual-task decrement", a measure of divided attention). • Assesses auditory & visual attention (but bias is auditory). • May be useful for high level clients but who have limited insight. • Evidence of ecological validity (e.g., there is some concurrent validity with measures of function). • For older adults (age 80+): With some cautions and modifications, the TEA can be used with this population: for example, the arrows on the Visual Elevator test may need enlarging and this test could be portrayed on 1 long wide sheet to reduce confusion; be cautious that the elevator up/down concept may be too difficult to grasp; and to prevent fatigue, abbreviate the introduction and/or provide only the most practical information during instructions throughout (see van der Leeuw et al., 2017). **Cons**: • Quiet room required + some extra materials required (stopwatch, CD player). • Quite high level, can be quite challenging. • Need to take time (about an hour) to try it out yourself prior to attempting to administer. • Interpretation of scores can be time-consuming. • Ceiling effects for some subtests for some age groups. • Caution in using with individuals with hearing or visual impairment (and see Pros above for older adults).

IV. IN-DEPTH *TASK PERFORMANCE* ASSESSMENTS:

In-Depth ***Task Performance***	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
AMPS: Assessment of Motor and Process Skills In-depth assessment; Task performance level **Population** ☒ Applicable to all adults ☒ Other: children age 2+ https://www.innovativeotsolutions.com/tools/amps	Training required (in-person or on-line). A standardized, performance-based, observational assessment to measure the quality of a person's ability for ADL and IADL tasks by rating the effort, efficiency, safety and independence in chosen, familiar, and life-relevant tasks (some personal care, but mostly domestic skills). The assessor selects 3-5 tasks likely familiar to the client (who then selects 2-3 of these tasks) from a list of 125 tasks within 13 major groups (from "very easy ADL tasks" including eating a snack with a utensil, to "much harder than average ADL tasks" including making Spanish omelette with added ingredients). Other tasks include raking grass, cleaning a bathroom, ironing a shirt, upper body grooming, shopping, etc.). Task is selected according to level of difficulty and meaning to person being assessed. The Process score relates to cognition. **Time to administer:** varies with activity chosen **Scoring:** Analyzed using software. 16 motor and 20 process skill items are rated on a 4-point scale (from 1-deficit, to 4-competent), generating a Process score and a Motor score. Cut-off scores have been developed between "needs assistance" and "independent". Once an OT has successfully calibrated as a reliable and valid AMPS evaluator, s/he is able to use a personal copy of the AMPS computer-scoring software to generate a Graphic Report and a Results and Interpretation Report. **Minimal Clinical Difference (MCD)**: *not determined to date.*	**Reliability**: A number of studies show excellent internal consistency, test-retest reliability and inter-rater reliability (Douglas et al., 2008). Some examples: • Excellent test-retest reliability (*elderly adults*). • The "severity calibrations" (using 'many faceted Rasch analyses') were stable over time for ≥ 92.5% of ratings for a group of 40 trained raters. **Predictive Validity:** • One study indicated excellent validity (for Process score) for predicting safety 2 weeks post-discharge home (*acute psychiatry*) (McNulty & Fisher, 2001). • However, another study indicates that AMPS did not predict problems with independent living for people with schizophrenia admitted to a mental health facility; therefore, the authors recommend it be used in conjunction with other functional performance measures (*Ayres & John, 2015*). • Process score is stronger than Motor score in predicting need for level of assistance to live in the community, although newer (2010) cut-off scores have only fair to good discrimination power using "ROC analysis". • In a study of community-dwelling older adults, AMPS scores were significantly related to self-reported functional limitations and disability (Bear-Leyman, 2018) – thus are AMPS scores a useful adjunct to self-report for this population? **Group Differences:** *(no literature reviewed to date)* **Other Aspects of Validity:** *Many studies have been conducted and, overall, the AMPS correlates with at least 5 other measures and is predictive of ADL, level of care, and independence in the home (Douglas et al., 2008). Some examples of research findings:* • Adequate to excellent concurrent validity compared to tests of cognition & function e.g. FIM & MMSE (*mild memory impairment or dementia*). • Poor concurrent validity in comparing AMPS Process score (measure of task) and the Large Allen Cognitive Level Test (measure of impairment) (*stroke*). • Adequate concurrent validity between AMPS Process score and level of employment (*schizophrenia*). • In comparing the validity of functional assessments to assess cognition (thus, specific to the cognitive subscales), the AMPS is more sensitive to change than the Functional Independence Measure (FIM) (Choo et al, 2018) (*post-acute inpatients: geriatric, neuro-oncology, and musculoskeletal*).	**Pros**: • Although training is expensive, group discounts are available and the OT is no longer required to complete testing of 10 people (for calibration) following the training. A Community of Practice may be available for knowledge translation. • Provides for a standardized, qualitative analysis of ADLs & IADLs. • Identifies between difficulties with process (cognitive) & motor (physical) tasks. • Some cultural sensitivity (e.g. client plans own meal of choice). • As per research, more useful in physical disability than mental health. • Easy to convert data to a written report: a program does this for you; also provide graphics. • Good for variety of age groups. • True performance-based, thus may capture more useful information than other task/performance tests such as ILS. • Based on MOHO. • Recommended for assessment of executive functions (EF) in a published inventory of tests of executive function for stroke (Poulin et al, 2013) – although there are cons to this, see below. **Cons**: • Expensive and time-consuming for training: either in-person (5 days, $995-$1,060 USD) or on-line (45 contact hours, $995 USD). • Then after training, a 1-year license is required with annual renewal of $99 USD/year. • Not specifically designed to evaluate for presence of cognitive impairments – but Process score can be used to help understand cognitive limitations. • Research recommends assessing client in home instead of clinic because environmental factors may influence performance in particular the Process score (Park 1994). • Mixed research results regarding predictive validity for independent living for psychiatric clients. • Assessor selects 3-5 tasks likely familiar to client (who then selects 2-3 tasks) – thus due to the familiarity, the AMPS may not assess EF very well (Poncet 2017). • There are limitations for use of the AMPS on its own to predict level of assistance or predict employment (see psychometrics).

In-Depth *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Executive Function Performance Test (EFPT) **(and alternate version, aEFPT)** In-depth assessment; task performance level *(executive functions)* (*Acts as a screening assessment if you use only 1 or 2 subtests, or if EFPT is used with higher functioning clients*) **Population** ☒ Acquired brain injury ☒ Older adults ☒ Schizophrenia ☒ Other: multiple sclerosis EFPT website: https://www.ot.wustl.edu/about/resources/executive-function-performance-test-efpt-308 YouTube videos on mock administration of this test: http://www.youtube.com/watch?v=vO2uvllh_ao http://www.youtube.com/watch?v=5SMzCouqcOs	A performance-based, standardized assessment of cognitive (executive) function. It examines 5 executive function components (initiation, organization, sequencing, safety & judgment, and completion) for each of 4 tasks (cooking oatmeal, telephone use, medication management, and bill payment). Aims to determine level of support required (i.e., what type of cueing or assistance is required) to perform IADLS. New: * 2015: alternate version, aEFPT: this version contains 4 additional tasks to complement the original EFPT, thus ensuring novelty for a repeat administration of the EFPT. The alternate tasks are within the same categories (cooking pasta instead of oatmeal; telephoning a doctor's office instead of a grocery store; sorting medications into a 7-day pill sorter instead of taking a medication; money management involving ordering an item from a catalog instead of paying 2 bills) (*see details on EFPT website*). * 2018: internet-based tasks for the bill paying and telephone-use tasks: - bill-paying instructions are available on EFPT website; software is also available at no cost: http://www.tau.ac.il/~portnoys/Internet-based_Bill_Paying_Task.html. - telephone: simply substitute a Google search for the telephone book * a culturally adapted version has been developed in Korea (EFPT-K) **Time to administer:** 45-60 minutes. Preferable to administer full test (4 tasks) but can use fewer tests for screening purposes. **Scoring:** Based on the amount of cueing provided. A total score of 100 can be calculated (the higher the score, the more difficulties the client has). **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability**: • Excellent internal consistency (*stroke, healthy controls, schizophrenia*). • Excellent interrater reliability (*mild stroke & healthy controls, multiple sclerosis*). • Alternate-form reliability established with on-line version tasks; and with aEFPT. **Predictive Validity:** • For individuals with severe traumatic brain injury, the EFPT predicts the self-perception of independence as measured by the TBI-QOL. **Group Differences:** • Differentiates between healthy controls and: - mild stroke, moderate stroke - brain tumour • Differentiates between acute and chronic schizophrenia. • Differentiates between controls, complicated mild/moderate, and severe traumatic brain injury. • aEFPT: differentiates between controls and stroke. **Other Aspects of Validity:** • Poor to adequate concurrent validity with various neuropsych tests, suggesting EFPT measures some differing aspects of cognition compared to these tests (*stroke, brain injury, & controls*). • Adequate to excellent concurrent validity with other executive function tests (BADS, DKEFS, EFRT), supporting the EFPT as a measure of executive functioning (*schizophrenia, acute stroke, chronic stroke*). • Adequate concurrent validity with FIM and a measure of IADLs, plus **e**xcellent concurrent validity with FAM and AMPS, suggesting EFPT is a good measure of function in particular IADLs (*stroke & healthy controls, chronic stroke*). (Lipskaya-Velikovsky, 2018) • For the on-line versions of bill paying and telephone tasks: - for bill paying: adequate to excellent construct validity when compared to trail making A & B; however, no significant correlation between telephone task and trail making - construct validity was not established for the on-line telephone task ***do not use this task in isolation for assessing EF***	**Pros**: • There is ecological validity (thus, assessment of EF in context of function), including that there are "on-line" versions available for bill-paying and telephone use. • Portable. • Helps determine supports needed for living at home. • The manual (test protocol booklet) and the on-line bill-paying task are available on-line, no cost. • EFPT is recommended for assessment of EF in a published inventory of tests of executive function for stroke (Poulin et al, 2013). • Alternate version is available (2015) allowing for repeat administration. **Cons**: • Need to gather and replenish items; need stove and phone (cell phone is okay); and need computer with internet access for internet version. • Verbal and written English fluency required. • May not provide a sufficient cognitive challenge for higher-functioning clients.
Independent Living Scales (ILS) *(Loeb 1996; not to be confused with the "Independent Living Scale" developed for brain injury)* In-depth assessment; Task performance level	The ILS is a standardized assessment of competence in IADLs, requiring the client to demonstrate problem solving, demonstrate knowledge, or perform a task. There are 5 subscales: memory/orientation, managing money (including outdated tasks), managing home and transportation, health and safety, and social adjustment – total 70 items.	**Reliability:** • Adequate to excellent internal consistency (*'non-clinical cases'*). • Excellent test-retest reliability (*'non-clinical cases' and schizophrenia*). • Excellent inter-rater reliability (*'non-clinical cases'*). **Predictive Validity:** • The "Managing Money" and "Health and Safety" subscales performed better than MMSE and Trails	**Pros**: • Includes performance-based testing (with scenario-based questions and actual tasks for the person to do, related to function at home), thus enhancing ecological validity. • Fairly good psychometric properties for use with individuals with schizophrenia and dementia (thus best suited for these populations) – there is some initial research with other populations (as per

In-Depth *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Population ☒ Traumatic brain injury ☒ Dementia ☒ Mental Illness ☒ Schizophrenia ☒ Depression https://www.pearsonclinical.ca/en/products/product-master/item-45.html See discussion on Prezi presentation (2015) at: https://prezi.com/xmmfwnosgaqx/ils-independent-living-scales/	**Time to administer**: about 45 minutes but varies. The manual recommends giving the entire test in one session. **Scoring**: Convert raw scores to standard scores (using charts in the manual, with different norms tables for different populations), which results in a total score as well as a score for each of the 5 subscales and a score for each of problem solving and performance/ information. Plot these 8 standard scores on a graph (provided on the test form) to determine if the person falls within category of *low*, *moderate* or *high* functioning for each score. (The standard score has a mean of 100 and a standard deviation of 15; higher scores = higher performance.) **Minimal Clinical Difference (MCD)**: *not determined to date*.	(A+B) in predicting ultimate judicial decision-making about competency (*in considering court judgments for 71 individuals with intellectual disability, and psychiatric and/or neurological diagnoses*) – with MM and HS scales having 73-78% sensitivity, and MMSE, TMT-A and TMT-B having 62-69% sensitivity. [Competency in this case referred to capacity for managing own affairs/making decisions about person, family and property.] **Group Differences:** • Differentiates between healthy controls and: - schizophrenia - severe brain injury • Does not differentiate between healthy controls and mild or moderate brain injury (but could be because of small sample sizes in the study). • Differentiates between these 3 groups: adults with chronic psychiatric disorders who have *high* vs. *moderate* vs. *low* Global Assessment of Functioning (GAF) scores. • Differentiates between 3 levels of functional outcome (minimum, moderate and maximum supervision) better than the GAF did (*for inpt and outpt schizophrenia*). **Other Aspects of Validity:** • Excellent concurrent validity with some tests of cognition (WAIS-R, MicroCog) (*'non-clinical cases'*). • Adequate to excellent concurrent validity with various executive function neuropsych tests (*dementia*). • Adequate concurrent validity with the "MATRICS consensus cognitive battery" (*schizophrenia*). • Excellent concurrent validity with the personal self-maintenance scale and the IADL scale of the Philadelphia Geriatric Centre Multilevel Assessment Instrument (*'non-clinical cases'*). • Excellent concurrent validity with the shorter (21 item) performance-based Test of Everyday Functional Ability - TEFA (*dementia*). • Excellent concurrent validity with the Dementia Rating Scale; poor concurrent validity with the Geriatric Depression Scale (*dementia*). • Poor to adequate concurrent validity with the Hopemont Capacity Assessment Interview (*healthy elders*). • Poor concurrent validity with a negative & positive symptom scale and with a quality of life scale – suggesting that ILS does not measure impact of these areas on independent living skills (*schizophrenia*).	manual, 1996), but lack of further studies with these other groups. • Appears to reflect cognitive aspects of performance (but may not reflect emotional influence e.g. depression; positive & negative symptoms). • As per 1 study (Quickel 2013), when used with other measures, the "Managing Money" and "Health and Safety" can assist in predicting competency; However: these subscales cannot make this determination on their own; and also keep in mind that some of the tasks are outdated thus not relevant/familiar to many clients. **Cons**: • This test is old. Cheque-writing and phonebook tasks are not relevant to many clients. • Lacks external research for many client groups (including recent stroke, TBI, and other cognitive impairments. • Costly: $612.75 CAN for initial kit, and then $125.00 CAN for set of 25 replacement forms. • Map-based way-finding task seems to be more of a memory and attention task than measuring the person's ability to way-find. • May not be sensitive enough to identify individuals with mild cognitive impairment. • Quiet room (private setting) recommended. • OT must obtain additional materials: telephone, telephone book (*thus very outdated*), various denominations of money (*including pennies!, thus outdated for Canada*), stop-watch, pen, paper, envelope. • Instead of using ILS, OTs working with dementia clients may want to explore use of KELS or TEFA (sold as the Texas Functional Living Scale, TFLS). These are newer and cost much less than ILS.
Kohlman Evaluation of Living Skills (KELS) ***4th edition was published in 2016*	The KELS was designed as a short basic living skills evaluation of an individual's ability to perform basic living skills (with a strong emphasis on cognitive perspective) for the	**Reliability (previous versions of KELS):** • Excellent inter-rater reliability (*acute psychiatry, and older adults*).	**Pros**: • Helpful for many settings (inpatient, outpatient, acute care). Research has focused on use with schizophrenia and older adults.

In-Depth *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
In-depth assessment; Task performance level **Population** ☒ Older adults ☒ Mental Illness (acute) ☒ Other: brain injury & "mental retardation" – but lack of psychometric studies https://www.caot.ca/client/product2/334/item.html *There are numerous YouTube videos of KELS (most by OT students):* http://www.youtube.com/watch?v=30FOxT2ubU4 (***2012***) https://www.youtube.com/watch?v=V83myLkwsU8 (***2014***) https://www.youtube.com/watch?v=EO_dIj6uEZY (***brief "Dos and Don'ts", 2016***) ***KELS 4 (2016):*** https://www.youtube.com/watch?v=B70WnfcPpe0	purpose of determining the degree of independence (and supports required) for return to community living. The KELS generally tests knowledge and not actual task performance. Includes items in 5 categories: Self Care, Safety & Health, Money Management, Transportation & Telephone, and Work & Leisure. The most recent version, KELS-4 (2016) includes updates as follows: • updated safety pictures • allows use of cell phone and electronic banking (if these are what client is familiar with) using the KELS Flash Drive (included) • removal of budgeting item • new score form format (with no cumulative score) **Time to administer:** approx 30-45 minutes (2016 version may take longer) **Scoring:** • Older versions: items are scored as independent (0), or needs assistance (1 ½ or 1 point). Total score ranges from 0 to 17; a person with a score of <6 is considered capable of living independently. • 2016 (KELS-4): A cumulative score is no longer computed. Instead, each item is scored (as "Independent" or "Needs Assistance"), providing guidance to help the OT with clinical reasoning in determining the most appropriate independent situation for the client (based on abilities of the client, and support required). **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Predictive Validity:** • As per the KELS-4 manual: "…not enough research has been completed to establish the predictive validity of a cumulative score…" (Thus, the aim of the KELS is to help the OT in their clinical reasoning process and not to provide a score to predict the best living situation.) **Group Differences (previous versions of KELS):** • Differentiates between healthy controls and individuals with schizophrenia. • Differentiated between 3 groups of elderly (living in community, living in sheltered housing, attending day care); and more sensitive than the FIM in differentiating these groups. **Other Aspects of Validity (previous versions of KELS):** • Excellent concurrent validity with Global Assessment Scale and with BaFPE. • Excellent concurrent validity with FIM and with an IADL measure (*older adults*). • Excellent concurrent validity with MMSE (*older adults*). • Construct validity supported in assessing older adults' capacity to live safely and independently in the community – as was determined by comparing KELS scores with a battery of tests often used to screen ability to function safely & independently in the community (measures of cognition, affect, executive & functional status).	• Useful for quickly obtaining information regarding the ability of a person to perform basic independent living skills. • Provides information to help the clinician suggest appropriate living situations that will maximize independence – although should be augmented with performance-based assessment (for example, kitchen assessment). • Cost: $151.20 CAD (KELS-4) as available through CAOT for members ($191.20 CAD for non-members); also available through AOTA. **Cons**: • Task-oriented but not fully performance-based. • Based on urban lifestyles. Some items must be scored 'not applicable' in rural areas. • No Canadian adaptations. • Additional performance-based testing should be done to supplement the KELS because it tests primarily *knowledge* rather than the *actual performance* of living skills. • Caution in using with individuals hospitalized more than 1 month/ for a long length of stay. • Not applicable to long term care settings (because of the activities/test items).

Multiple Errands Test (MET)
 	
In-depth assessment;
Task performance level
(high level cognitive/ executive functions)
 	
Population
☒ Acquired brain injury
☒ Mental Illness
 	
***For high level clients. Developed for individuals with cognitive deficits who are independently mobile, verbal, & able to read/follow*
	The MET is a complex shopping/errands task performed in a shopping mall or hospital environment (with a home version and Big-Store version also recently developed). This includes completion of a variety of tasks, rules to adhere to, and a specific time frame. The assessor observes the client (follows client) while the client carries out the errands. This test assists in assessing executive functioning including to help determine capacity for independent community living skills. Poor performance is also associated with impairments in attention, memory, and processing speed (Hansen, 2019).
	
	• MET-R = MET-Revised. The rrevised scoring format, including to make scoring more
		Reliability:
		• Excellent inter-rater reliability is reported in many studies including the pooled results of a systematic review (Rotenberg, 2019). For example:
		  • Adequate to excellent inter-rater reliability (*normal controls and community dwelling acquired brain injury*).
		  • Excellent inter-rater reliability (*mild CVA, community dwelling ABI*).
		  • Excellent inter-rater reliability for BMET-R versions A and B (*ABI*)
		  • MET-home: excellent inter-rater reliability; poor to adequate internal consistency (Burns et al., 2019).
		  • Big Store-MET: excellent inter-rater reliability; poor internal consistency (Antoniak et al., 2019)
			Pros:
			• No cost for test materials.
			• Has ecological validity, assesses what individual can do.
			• VCH has developed forms that allow for development of a MET for specific settings; & to provide instructions & scoring (although as of 2020, these may need updating)
			• MET is recommended for assessment of executive functions in a published inventory of tests of executive function for stroke (Poulin et al, 2013).
			• Workshops have been offered by CAOT.
			
			Cons:
			• The OT needs to develop the specific MET for the setting to be used. Consider first creating a template that can be used to develop versions for

In-Depth ***Task Performance***	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
instructions (with a focus on assessing executive functions).	objective, remove possible double-counting e.g. of a task failure also being scored as a rule break; and some new scoring. • MET-HV = MET hospital version. • BMET-R = Baycrest Hospital version revised, to replace BMET: to improve construct validity; be more representative of everyday life challenges; and to better discriminate between individuals with ABI and healthy controls, also with an alternate version to permit retesting (Clark et al, 2016). • MET-Home (Burns et al., 2019.) • Big Store-MET (Antoniak et al., 2019) • yMet: youth version (age 16-24): initial study indicates that overall performance of healthy youths is similar to healthy adults (Hanberg, 2019). **Time to administer:** 20-60 minutes or longer (depends on tasks involved, client performance) plus travel time (if required) **Scoring**: • self-evaluation (ratings) • errors (scores for task failures, inefficiencies, rule breaks) • observational (qualitative) information: optional but can be very useful (behavioural observations, strategies used) **Clinicians must be cautious in interpreting single errors observed in individuals with cognitive deficits, being that healthy controls also make errors (Bottari, 2011). **Interpretation of score**: The VCH template provides a general guideline for cut-off values for normal expected performance based on info in literature to 2010 (not updated since then). **Minimal Clinical Difference (MCD)**: *not determined to date.*	**Predictive Validity:** • Adequate predictive validity of MET-HV when administered on discharge from inpatient rehab, in predicting Participation Index (M2PI) score administered 3 months later (*ABI*). • Ecological validity was supported using MET-HV in terms of its ability to predict (using regression analysis) aspects of the FrSBE and DEX (measures of frontal lobe/executive function difficulties) (*community-dwelling ABI*). **Group Differences:** • Evidence of group differences ("known group validity") is reported in many studies including the pooled results of a systematic review (Rotenberg, 2019). For example: • Differentiates between healthy controls and: - inpatients/outpatients with ABI - individuals with mild CVA (community *dwelling*) • VMET (virtual MET): differentiates between individuals with Parkinson's disease who have mild cognitive impairment, and PD without cognitive impairment, and better than other measures of EF in differentiating between these groups. • The 2 versions of the BMET-R differentiate between participants with ABI and healthy controls. • MET-home: differentiates between matched healthy controls and individuals with stroke (Burns et al., 2019). **Other Aspects of Validity:** • Adequate concurrent validity with other measures of executive dysfunction (including BADS, Wisconsin Card Sorting Test) (*healthy controls, inpatients/outpatients, community dwelling ABI*). • Adequate to excellent concurrent validity in correlating some subscores of MET with process and motor scores of AMPS. • Ecological (construct) validity: supported in that there are numerous adequate to excellent correlations with measures of executive dysfunction, function (AMPS) and participation (Mayo-Portland Participation and Adjustment Inventory). • Ecological (construct) validity: supported in that the MET is more sensitive than traditional neuropsych measures of executive function in differentiating between healthy controls and inpatients/ outpatients with ABI – i.e., individuals with ABI may do well on traditional tests but still present with dysexecutive syndrome as assessed by real-world shopping task. • Adequate concurrent validity with the EFPT (mild CVA, community dwelling). • Poor to adequate concurrent validity with a functional outcome (Social Autonomy Scale) thus	different settings (a template is available for VCH and PHC clinicians). • Need to provide client with some money – thus the OT needs a petty cash/funding source (or to develop items/version that do not require the client to make purchases). • In research, the 2 versions of the BMET-R were found to not identically assess executive deficits – thus use caution in constructing and validating alternate versions of MET (and performance-based measures in general).

In-Depth *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
		provide some similar and differing measures of function (*schizophrenia*). • No correlation when compared with 2 neuropsych tests (WAIS-IV and Wisconsin Card Sorting Test), thus MET measures quite different cognitive constructs than these tests (*schizophrenia*). • MET-Home: face and content validity were established; moderate associations found with other EF tests such as SDMT, Delis-Kaplan Executive Function System, and EFPT (Burns et al., 2019).	
Texas Functional Living Scale (TFLS) Screening assessment (more so than in-depth); Task performance level **Population** ☒ Traumatic brain injury ☒ Dementia ☒ Schizophrenia ☒ Other: intellectual disability; autistic disorder ***Norms****: The norms in the manual (2009) are for various diagnostic groups, age 16-90 (800 examinees included in normative sample).* http://www.pearsonclinical.com/therapy/products/100000222/texas-functional-living-scale-tfls.html	The TFLS is comprised of 24 items assessing cognition in the context of specific impairment as well as various IADLs. It is divided into 4 subscales assessing ability to use analog clocks and calendars, perform calculations involving time and money, utilize basic communication skills in everyday activities, and memory. The 4 subscales are: time, money & calculation, communication, memory. Tasks also tap into other cognitive skills such as complex visual search and praxis – but not all tasks necessarily correspond in a simple/tidy way to specific cognitive factors (Lowe et al., 2020). **Time to administer**: approx 20 minutes. Can be administered across more than 1 session, as long as item #22 is done in 1st session. **Scoring**: Raw scores are converted into cumulative percentages and the total raw score can then be converted into a T-score. The manual provides qualitative descriptors (categories) for cumulative percentages and T-Score (from "severely impaired" to "high average"). The manual also provides suggestions for score cut-offs to suggest whether the person has adequate functional competence for independent living; assisted living; or a special care unit. ***However***, it is cautioned: "…Recommendations about level of care should not be based on a single score but should include multiple aspects of assessment and information sources…". Therefore, avoid using these cut-off values. **Minimal Clinical Difference (MCD)**: *not determined to date*. Be aware of potential practice effects.	**Reliability**: • Adequate to excellent internal consistency (*Alzheimer disease*). • Excellent inter-rater reliability (*for normative sample*). • Excellent test-retest reliability at 1 month (*Alzheimer disease*). • Practice effects: there is slightly higher performance when tested the 2nd time due to practice effects (roughly a ¼ standard deviation of the T-Score) suggesting relatively consistent performance over time – but the OT should be aware of this. **Predictive Validity:** • *Nothing found to date*. **Group Differences:** • Differentiates between healthy controls and adults with Alzheimer`s disease, and dementia in general. • Does not differentiate between normal controls and mild cognitive impairment (MCI). **Other Aspects of Validity:** • Excellent concurrent validity in comparing TFLS to the Independent Living Scales (ILS), although only adequate concurrent validity in comparing the memory subscales (*dementia*). • Excellent convergent validity in comparing with the MMSE (*dementia*). • Adequate convergent validity in comparing with an informant-rated measure of daily functioning, the Blessed Dementia Rating Scale (BDRS) (*Alzheimer disease*). • As expected, poor correlation in comparing TFLS with a dementia behaviour rating scale, thus demonstrating the expected discriminant validity (i.e., showing that the tests measure different constructs: the TFLS assesses functional skills, and the rating scale taps emotional and behavioral disturbance) (*Alzheimer disease*).	**Pros**: • Provides a fairly quick screen of cognition in the context of IADLs. • In considering the excellent convergent validity with the MMSE, the TFLS can be used to assess overall level of cognitive impairment while providing clinical information that is ecologically valid (i.e. relating to function). • Test items are easily obtained (e.g. a current calendar, stopwatch, telephone etc.). • Allows OT to provide prompts to the client to obtain best score. • Direct observation reduces patient/caregiver reporting bias. • Memory subscale assesses 3 aspects of memory: immediate recall, delayed recall, prospective memory. • May be quicker to administer than ILS. • Relatively affordable (compared to other measures): less than $200.00. **Cons**: • Money and calculation subscale use US $ including $1 bills & pennies (need to adapt for this). • Communication subscale uses tasks that may not be familiar to your client (especially younger adults): cheque writing, use of phone book, addressing envelope. • Test results alone are NOT conclusive – must use clinical reasoning taking into consideration other assessment activities/tests.
UCSD Performance-based Skills Assessment: UPSA-2, UPSA-Brief (UPSA-B), computerized UPSA (C-UPSA)	The UPSA and subsequent/modified versions were initially developed for use in research/clinical trials, to assess basic everyday living skills in older people with schizophrenia; but is now available for clinical	**Reliability**: • UPSA: Excellent interrater reliability (schizophrenia and schizoaffective disorder); adequate test-retest reliability over periods up to 36 months (*schizophrenia*).	**Pros**: • The primary strength is as a measure of function (and not as a measure per se of cognition). • UPSA is stronger (has greater validity) than UPSA-B in terms of predicting function and

In-Depth ***Task Performance***	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)

In-depth assessment;
Task performance level.
 	
Population
☒ Mental Illness (primarily schizophrenia; but also other mental illness including depression)
 	
Note: UPSA is not (yet) validated for stroke or other acquired brain injuries, or mild cognitive impairment
 	
***Norms**: one study indicates norms are not applicable because this is a disability measure, and disabilities are not present in a healthy population; however, another study has developed norms for UPSA-B (Vella 2017).*
 	
https://verasci.com/what-we-do/endpoints-assessments/upsa/ (*contact information is provided to obtain permission to obtain and use UPSA*)
 	
https://eprovide.mapi-trust.org/instruments/university-of-california-san-diego-performance-based-skills-assessment
 	
YouTube video showing tutorial for administration and scoring of the UPSA-2-VIM (<10 minutes): https://www.youtube.com/watch?v=QGRfOAl84jU&feature=youtu.be
	purposes. It is a performance-based ("role playing") assessment:
	
	• The original UPSA consists of performance tasks that represent 5 domains of functioning felt to be essential to an older adult's ability to function independently in the community: (1) financial skills (counting change, bill paying); (2) communication (including telephone tasks relating to a medical appointment); (3) comprehension & planning (planning a trip to the beach/zoo); (4) transportation (reading a bus route); and (5) household management (reading a recipe, completing a shopping list) (*see a more detailed description of the original items in Patterson et al., 2001; and updated information in YouTube video given in column 1*).
	
	• UPSA-1 was updated to become UPSA-2. Modifications included adding a medication management task (later removed for UPSA-2-VIM). The UPSA-2ER (extended range) has the same subscales but additional questions to increase level of difficulty for each.
	
	• UPSA-2ER (extended range version) has the same 6 subscales, but with additional questions to increase the level of difficulty for each subscale.
	
	• UPSA-2-VIM (2009) is a version modified for the Canadian population and for use by Vancouver Coastal Health for clinical purposes. It is recommended that Canadian OTs use this version. Obtain permission (see website in first column).
	
	Other versions:
	
	• UPSA-brief (UPSA-B) contains only 2 domains: communication and finance (see further details in Mausbach 2007). It is widely used in research.
	
	• C-UPSA contains 4 of the original domains: planning recreational activities, finances, communication, and transportation. It is more portable and takes less time to administer than the original UPSA.It appears to be highly related to the original UPSA for individuals with schizophrenia (see Moore et al., 2013).
	
	• There are also versions in other languages/ countries (e.g. Spanish, Japanese, Brazil Portuguese) (*references not listed on this Inventory*).
		• All versions: Adequate to excellent test-retest reliability across a number of studies (*Becattini-Oliveira 2018, systematic review*)
		• UPSA-B: Poor to excellent (but mostly adequate) test-retest reliability (*schizophrenia, schizoaffective disorder, delusional disorder*).
		
		Predictive Validity:
		• Higher scores on UPSA and UPSA-B are generally associated with higher ratings of functioning in daily living skills and work skills (*schizophrenia, schizoaffective disorder, bipolar disorder*) (Mausbach 2008, 2010, 2011).
		• UPSA-B total scores were found to be unrelated to self-reported IADL independence vs. dependence (*HIV positive*).
		
		Group Differences:
		• The UPSA differentiates between normal controls and middle-aged & older outpatients with schizophrenia and schizoaffective disorder, even when accounting for age differences (Patterson et al., 2001).
		• However another study found that there were no significant group differences for 2 of the subscales (household management and transportation) (Heinrichs et al., 2006).
		• UPSA differentiates between outpatients with bipolar disorder and healthy controls.
		• C-UPSA differentiates between healthy controls and schizophrenia for total score and for 2 of the subtests: finances and transportation.
		• Initial research shows a trend (but not statistical significance) for UPSA-B to discriminate between HIV+ and HIV- individuals; more research needed.
		
		Other Aspects of Validity:
		• Relationship btwn UPSA versions*:* excellent:
		  • *UPSA and UPSA-B*: Excellent concurrent validity (*schizophrenia*).
		  • *UPSA, UPSA-B and* C-UPSA: excellent concurrent validity (*schizophrenia*)
		• UPSA & symptoms: poor or no association:
		  • Multiple studies indicate performance on UPSA and UPSA-B is not related (or is poorly related) to negative-positive symptoms (schizophrenia) or mood symptoms (*major depression, bipolar disorder*).
		  • For depression: Did not correlate with a depression rating scale (*Christensen 2020*)
		• UPSA & cognitive measures: mixed results:
		  • Adequate to excellent in comparing UPSA with tests such as MMSE, RBANS, and a number of other cognitive/neuropsych tests (*for example as per review in Silverstein et al, 2011; Becattini-Oliveira 2018, systematic review*).
		  • For depression: Poorly correlated with the Digital Symbol Substitution Test (Christensen 2020).
			independent living. ***but see also Cons below, clinician feedback***
			• Primarily for individuals with mental illness; holds some promise for use with other populations but more research is needed.
			• Many mental health clinicians are using UPSA instead of ILS because of the stronger focus on organization and planning skills vs. knowledge-based items.
			• No cost for manual (once permission to use it is obtained – note that VCH has permission). Low cost to set up the items required (coins and replica money, unplugged telephone, copy the various paper items from the manual including utility bill, recipe, maps etc.).
			• Ease of use: not cumbersome to carry/store; can be broken up over 2+ sessions; questions are clear.
			• Has been adapted for Canadian population (including specifically for use by VCH).
			• Together with other measures (such as observational assessment during real-life activities, and collateral information) plus clinical reasoning, the UPSA can help the OT in determining likelihood of success for independent living.
			
			Cons:
			• Does not predict employment.
			• Users need to obtain written permission from the developer to use the UPSA.
			• The authors who developed this measure recommend that several hours of training is required; yet it is not easy to find/access this training. However, clinicians feel that an orientation can be provided by a peer who is familiar with the test.
			• UPSA cannot determine specifically whether cognition is the primary limiting factor for everyday function versus (or in combination with) other factors. Another factor is inexperience with independent living (community living skills).
			• Some of the role play tasks are primarily verbal in nature, thus would not be appropriate for individuals with verbal/language difficulties.
			• One study raised the possibility of a ceiling effect limiting the power of UPSA subscales to discriminate between healthy controls and outpatients with schizophrenia.
			• Clinician feedback relating to ecological and predictive validity:
			  - Not all situations are realistic and/or relevant.
			  - The client might do well overall on testing, but present with poor judgment, planning & decision making in real life.
			  - The grocery list task, financial management task (making change), and bus route/ transporation task don't necessarily help

In-Depth *Task Performance*	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
	Time to administer: UPSA, about 30 minutes; UPSA-B, about 10-15 minutes; C-UPSA about 15 minutes; UPSA-2 about 45 minutes; UPSA-2ER, about 60 minutes. **Scoring** (UPSA-2-VIM): Using a score sheet, the raw scores are converted to allow for a total score ranging from 0-100, with higher scores representing higher level of everyday function. The lower the score, the lower the person's function. The UPSA-2-VIM is best used to determine who cannot live independently, than to determine who can live independently: • <75: likely unable to live independently • ≥75 may or may not be able to live independently; further information needs to be considered in order to make recommendations. **Minimal Clinical Difference (MCD)**: One study indicates the estimated MCD for UPSA is 6 to 7 points (Harvey et al., 2017, major depression).	• UPSA-B: Adequate correlation with cognitive functioning as measured by the Dementia Rating Scale (*schizophrenia*); and adequate correlation when measured by a neuropsych test battery (*HIV positive*). Poor to adequate correlation with a variety of cognitive tests/batteries (*mental illness, Becattini-Oliveira 2018, systematic review*) • C-UPSA: Excellent correlation with RBANS for schizophrenia but not for healthy controls. • UPSA & functional measures: best for UPSA: • Excellent concurrent validity in comparing UPSA with DAFS (a performance-based measure developed for use with dementia) (*schizophrenia and schizoaffective disorder*) • Generally poor to adequate concurrent validity in comparing UPSA-B and C-UPSA with functional measures (*schizophrenia, schizoaffective disorder, delusional disorder*) • UPSA & independent living: best for UPSA: • Across studies, the full UPSA (and not so much the UPSA-B) correlated well with residential status, specifically the proportion of individuals living independently (Szabo, 2018: *systematic review – schizophrenia*) • UPSA & employment: no association: • Across studies, no association between the UPSA (and UPSA versions) and ability to work (Szabo, 2018: *systematic review – schizophrenia*) • UPSA & quality of life: Poor: • Poor in comparing with QWB (a self-report health-related quality of life measure) – thus these measures appear to assess different constructs (*schizophrenia & schizoaffective disorder*). • Poor in comparing with Quality of Life Scale (*Szabo 2018, systematic review, schizophrenia*)	provide a measure of real life skills or independent living. - Some tasks are not very useful for specific age groups (e.g. trip to the water park not applicable to seniors; bus schedules not applicable for individuals who use their phone for trip planning). - There are no health and safety questions (thus it may help to supplement UPSA with the ILS Health & Safety questionnaire). - Although the cut-off score may help predict someone who cannot live independently (i.e. <75/100), a score ≥75/100 does not accurately predict that they can live independently. - Caution: never make recommendations for housing & supports based solely on results of UPSA; the OT must combine with observational assessment (real life community navigation, shopping, cooking etc.) and collateral information (family, friends, other clinicians).

V. NICHE ASSESSMENTS:

***Niche* assessments (not used often at VCH/PHC)**	**Overview**	**Psychometrics – Reliability & Validity**	**Pros & Cons (from literature & clinicians)**
Cognitive Performance Test (CPT) In-depth assessment; Task performance level **Population** ☒ Older adults ☒ Dementia http://www.erp.ca/Cognitive-Performance-Test-ERP1820.html	The CPT (revised 2018) is a performance test based on the Allen Cognitive Disability theory, developed primarily for use with adults with dementia/Alzheimer's Disease. The CPT5 is a shorter version developed for primary care. *The following information relates to the 2018 version of the CPT. Tasks are similar to previous versions but scoring may differ.* There are 6 original tasks: dressing, shopping, telephone, toast preparation, washing, and traveling. Later a 7th task was added: "medbox". These test tasks aim to assess working memory, task planning, problem solving, divided attention, and new learning in the context of function, with the aim of helping categorize a person in terms of cognitive and functional decline and the supports s/he may require. **Time to administer:** At least 45 minutes for all 7 tasks (if mild to moderate cognitive disability). Recommended to administer all tasks (at minimum, 4 – otherwise final score is skewed). **Scoring:** Four tasks scale to Level 6 and three tasks (with less complex processing requirements) scale to Level 5. The total score is an average of each task score and, therefore, max 5.6 (= intact functioning). Each half level is described on a CPT Cognitive-Functional Profile, *for example*: • Level 1.0 = late-stage dementia and unresponsive to surroundings; needs comfort/hospice approach to care; • Level 4.0 = moderate functional decline, relies on familiar routines and environments, needs others to do IADLs, some decline in ADLs, needs structure, routines, some supervision, not safe to live alone; • Level 5.0 = mild functional decline, difficulties may manifest in IADLs (e.g. finances, job, driving, complex med regime) but not ADLs, and may need check-in support and assist with IADLs. **Minimal Clinical Difference (MCD)**: *not determined to date.*	**Reliability:** • Excellent internal consistency (*dementia*); adequate internal consistency (*geriatric rehab unit patients*). • Excellent inter-rater and test-retest reliability (*Alzheimer disease; outpatients with dementia; individuals with memory deficits*). **Predictive Validity:** • May have some predictive validity of risk of institutionalization over time (over a 4-year follow-up period (*dementia*). • In one study, the CPT was found to have a higher predictive ability to determne when someone should stop driving (as measured by failing a driver test) than the MMSE and MoCA (*community-dwelling, older adults who had been evaluated for cognitive impairment*). **Group Differences:** • Differentiates between healthy elderly and outpatients with dementia. • Differentiates between unimpaired adults and those impaired who are on a geriatric rehab unit. **Other Aspects of Validity**: • Excellent concurrent validity with MMSE (normal elderly controls, Alzheimer disease, and outpatients with dementia); and adequate concurrent validity with SMMSE (*older adults on geriatric rehab unit*). • Excellent concurrent validity with the Routine Task Inventory (a cognitive functional scale that uses non-structured observation of daily tasks) (*outpatients with dementia*). • Adequate concurrent validity with AMPS and FIM (older adults on geriatric rehab unit) – which makes sense because AMPS and FIM scores include motor and process/cognitive elements. • Adequate to excellent concurrent validity with 2 measures of caregiver-rated ADL (*normal elderly controls, Alzheimer disease*). • *Further validity results are discussed on the web-site but specific details of these results were not found in peer-reviewed literature*.	**Pros:** • Fairly easy to administer. • Focus is on function. • Research has shown that age, sex and years of education did not significantly relate to CPT scores (for geriatric rehab inpatient patients). **Cons:** • Very expensive (>$1,000 CAD) • Specific to use with older adults in particular dementia – thus a very niche population. • Requires significant materials (some are provided with purchase of the test) and designated space. • Researchers suggest: avoid administering only some subtests. Further, to ensure reliability of the overall score, the OT should administer all subtests.

Niche assessments (not used often at VCH/PHC)	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
Middlesex Elderly Assessment of Mental State (MEAMS) Screening assessment; Impairment level *(global)* **Population** ☒ Acquired brain injury ☒ Older adults ☒ Dementia http://www.pearsonclinical.com/education/products/100000142/middlesex-elderly-assessment-of-mental-state-the-meams.html	Designed to detect (screen) gross impairment of cognitive skills in the elderly. 12 subtests: orientation, memory, new learning, naming, comprehension, arithmetic, visuo-spatial skills, perception, fluency, motor perseveration. Two of the sub-tests are taken from the Rivermead Behavioural Memory Test (RBMT). Two parallel versions (A and B) allow for test-retest. **Time to administer:** 10 minutes **Scoring:** Each subtest is scored 1 (pass) or 0 (fail). Total score: • 10-12: expected range for normal elderly • 8-9: borderline cognitive impairment, needs further cognitive assessment • <7: definitely needs full cognitive evaluation **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability**: • Adequate to excellent internal consistency (*hospitalized elderly, acquired brain injury*). • Excellent parallel form reliability between Version A and B (*community living older adults with depression or dementia*). • Adequate parallel form reliability (*hospitalized elderly*). • Excellent test-retest reliability (*dementia*). • Excellent inter-rater reliability (*older adults with dementia or depression*). **Predictive Validity:** • *No research to date*. **Group Differences:** • Differentiated between older adults with dementia vs. depression. **Other Aspects of Validity:** • Construct validity: found to be more sensitive than MMSE in detecting mild cognitive impairment (*elderly acute psychiatry*). • Construct validity: questionable as a cognitive screen by findings of one study in that the MEAMS as compared to a detailed neuropsych battery had an unacceptable high false negative rate – i.e., not a very sensitive screen for overall cognitive impairment (or specifically for memory, language, perception or executive problems) (*stroke*). • Adequate to excellent concurrent validity with MMSE and Clock-drawing (*hospitalized elderly*). • Adequate concurrent validity with FIM (*hospitalized elderly, acquired brain injury*).	**Pros** • Quick to administer. • The test "manuals" provide very clear guidance for all questions to be asked. • Two parallel forms allow for test-retest (although only adequate parallel version reliability in one study). **Cons**: • Old (the manual is dated 1989); no recent psychometric research (since a review in 2008). • Developed only for use with elderly. • Not suitable for those with severe receptive language impairment (i.e., unable to follow simple instructions). • Cost (approx $250.00 USD) for full kit; less if just the manual or extra score sheets. • Questionable in some research as a cognitive screen (not very sensitive to cognitive impairment). • Adequate but low correlations with function as measured by FIM.
The Perceive, Recall, Plan, Perform (PRPP) System of task analysis In-depth assessment; Task performance level **Population** ☒ Acquired brain injury ☒ Schizophrenia ☒ Other: generally useful for anyone with suspected cognitive impairment Descriptions: http://www.occupationalperformance.com/the-perceive-recall-plan-perform-prpp-system-of-task-analysis-2/#:~:text=The%20Perceive%3A%20Recall%3A%20Plan%20and,routine%2C%20ta	The PRPP is a standardised, 2-stage, criterion-referenced assessment (*based upon the Australian Occupational Performance Model*). In a general sense, it provides a framework to enhance observational assessment/ task analysis of a client's information processing (cognitive function) during routines, tasks and sub-tasks that are meaningful and relevant to the client. The framework guides task analysis in terms of *Perception* (attention and sensory perception), *Recall* (memory), *Planning* and Performance (e.g. initiation, continuation, self-monitoring). (*See Fry & O'Brien 2002 for further description*.) **Time to administer:** varies with the severity of information processing difficulty and the complexity of tasks assessed. In most cases, it takes 1-2 hours to administer 4-5 tasks. **Scoring**:	**Reliability**: • Adequate internal consistency (*schizophrenia*) • Adequate to excellent inter-rater reliability between trained therapists (*brain injury; schizophrenia, mild dementia*). • Adequate to excellent test-retest reliability (*adults with brain injury; children with autism*). • Poor to excellent inter-rater reliability, depending on aspect of the PRPP. Poor reliability for individual items, but adequate to excellent reliability for average test agreement – thus showing that the total PRPP is more reliable than single steps of the PRPP (*dementia*). • Higher inter-rater reliability for therapists who use the PRPP more often than monthly, than those using it less often than monthly (*adults with brain injury*). **Predictive Validity:** • *no research found to date* **Group Differences:**	**Pros** • Developed by OTs. • Can use this framework with any functional activity selected by the client or OT (unlike the AMPS where the OT has to select from a list of tasks). • Makes use of tasks within the client's own life. • Takes into consideration: observation of task performance; contextual (environmental) influences, and cognitive component abilities. **Cons** • Training (which is difficult to access) is highly beneficial to enhance the OT's competence and confidence in using the framework (and to obtain written copies of the framework/assessment). However, the trainers are based in Australia and so training is difficult to access for Canadian OTs. • No new research since about 2010

***Niche* assessments (not used often at VCH/PHC)**	**Overview**	**Psychometrics – Reliability & Validity**	**Pros & Cons (from literature & clinicians)**
sk%20or%20subtask%20performance. http://www.occupationalperformance.com/the-perceive-recall-plan-perform-prpp-system-of-task-analysis-2/	• Stage 1: the OT employs a standard behavioural task analysis, breaking down everyday task performance into steps and identifying *errors in performance* as relate to perceive, recall, plan and perform. • Stage 2: a cognitive task analysis is used, directed at the *cognitive processes* underlying performance. **Minimal Clinical Difference (MCD)**: not applicable.	• *no research found to date* **Other Aspects of Validity:** • Ecological validity is supported by the PRPP being a criterion-referenced measure involving everyday activity/tasks. • Adequate concurrent validity of PRPP using a complex task (but not using a simple task) with the Independent Living Skills Survey (a questionnaire that measures community functioning in people with severe mental illness) (*schizophrenia*). • Construct validity is supported in terms of a measure of cognitive strategy use, in that there are strong parallels between a Rasch-generated hierarchy of PRPP items, and conceptual models of information processing and occupational performance (*adults with brain injury*).	
Swanson Cognitive Processing Test S-CPT In-depth assessment; Impairment level *(information processing, working memory)* **Population** ☒ Other: students; learning disabilities ***Norms**: age 5 to adult; to date research has focused on use in educational settings (i.e., learning disabilities).*	A battery of 11 information processing/working memory subtests: semantic association and categorization; auditory digit, nonverbal, and picture sequencing; phrase recall, story retelling, rhyming; spatial organization, directions, and mapping skills. An abbreviated version has 5 subtests. A systematic cuing system is used, to allow measurement of the client's potential competence when provided with probes/hints (considered 'dynamic assessment'). Results therefore represent the client's "processing potential" which is the difference between their actual performance level and what they can achieve with probes. **Time to administer:** 3+ hours (sometimes 4-5 hours) **Scoring**: 7 composite scores representing mental processing ability, 'probe score', processing difference score, etc. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Reliability**: • Adequate to excellent internal consistency (*initial norm group of USA and Canadian children and adults; college students*) **Predictive Validity:** • *No studies found to date*. **Group Differences:** • Differentiates between learning disabled and non-learning disabled (*children, college students*). **Other Aspects of Validity:** • *No information seen.*	**Pros** • Some OTs have found this test useful with higher level clients who wish to return to school (for example, to help identify strategy use, strengths & weaknesses in working memory, connect performance to academic achievement). • Can use all 11 tests or selected subtests; can administer in 1 or 2 sittings. • Allows OT to come up with ideas for interventions. • A dynamic tool in that the OT can provide hints; thus demonstrates learning, strategies used. **Cons** • The manual/forms may be difficult to find. • Takes a very long time to administer plus extra time to prepare. • Research has focused on use of this test in educational (not health care) settings. • Clinically, appears to be more sensitive to higher functioning clients. • Query sensitivity to different ethnic/cultural groups. • Not easy to learn; needs practice beforehand. • May be a little overwhelming for client and therapist. • No recent published studies.
Test for Nonverbal Intelligence (TONI) *Note: don't confuse with the CTONI (Comprehensive Test of Nonverbal Intelligence).* Screening assessment; Impairment level *(intelligence)* **Population**	This test is described as a language-free measure of cognitive ability. It is a neuropsych measure focusing on a small piece of the construct of "fluid intelligence" (purporting to measure aptitude, abstract reasoning, problem solving).It was designed for use with children and adults. There are 2 parallel versions (A and B). All items are abstract/figural; verbal or non-verbal instruction is provided; and the evaluee responds with simple but meaningful gestures such as pointing, nodding or blinking. The most	**Reliability**: • Poor to excellent internal consistency (various populations). • Excellent test-retest and parallel form reliability for an earlier version (children). • *No additional published research could be found including for TONI-4; manual unavailable for review*. **Predictive Validity:** • *No published research on validity could be found on TONI-3 or TONI-4; manuals unavailable for review*.	**Pros**: • Completely non-verbal. • Simple instructions; can be administered by anyone who follows instructions carefully and has some formal training in assessment. • Detailed directions for administering, scoring, and interpretation (in the manual). • A 20-year body of reliability and validity research is cited and summarized in the test manual. • Good for pre- and post test application. • Low cultural loading. **Cons**:

Niche assessments (not used often at VCH/PHC)	Overview	Psychometrics – Reliability & Validity	Pros & Cons (from literature & clinicians)
☒ Other: children & adults for measuring intelligence (where traditional tests are inappropriate) http://www.pearsonclinical.com/psychology/products/100000612/test-of-nonverbal-intelligence-fourth-edition-toni4.html?pid=TONI-4&Community=CA_Ed_AI_Ability	recent version is the TONI-4, with updated norms. TONI-4: Test directions available in: English, Spanish, French, German, Chinese, Vietnamese, Korean and Tagalog. The TONI-4 manual contains new norms to help ensure proper representation of demographic changes in the U.S. population. **Time to administer**: 15-20 minutes. **Scoring:** Raw scores can be converted to age-based percentiles or index (standard scores) and compared to norms. **Minimal Clinical Difference (MCD)**: *not determined to date*.	**Group Differences:** • *No published research on validity could be found on TONI-3 or TONI-4; manuals unavailable for review*. **Other Aspects of Validity:** • *No published research on validity could be found on TONI-3 or TONI-4; manuals unavailable for review*.	• A review of an early version of the TONI recommends exercising *extreme caution* in interpreting results of this test as a measure of intelligence, in part because it is a non-verbal test (Shelly, 1982). • It's unclear how results can/should be used to better understand function/occupational performance. • There is limited published research on current and recent versions (TONI-3, TONI-4); need test manual to review psychometrics. • Accessible research literature focuses primarily on use of the TONI as a measure of intelligence (for adults and children), without addressing any concurrent or predictive validity for measures of everyday function. • Cost is about $380.00 for initial kit, and then $60.00 for each subsequent package of 50 test forms.

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Asher, I. E. (2014). *Occupational therapy assessment tools: An annotated index* (4th ed.). Bethesda (MD): American Occupational Therapy Association.

General websites: Rehab Measures: https://www.sralab.org/rehabilitation-measures

StrokEngine: http://strokengine.ca/assess/

Cognitive assessment and virtual health/telehealth (*Note: a full list of internet and other resources on this topic is beyond the scope of this document*)

Note: become familiar with guidelines/regulations set by your professional health care college or licensing body

PAR assessments, cautions for telehealth: https://www.parinc.com/Using-PAR-digital-assessments-during-the-COVID-19-crisis

Pearson assessments: considerations for telehealth: https://www.pearsonclinical.ca/en/telepractice.html

MoCA: cautions for use during telehealth: https://www.healio.com/news/primary-care/20200608/qa-conducting-cognitive-assessments-via-telehealth-amid-covid19

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The Repeatable Battery for the Assessment of Neuro-psychological Status (RBANS)	Following are some selected papers. See the website for a long and comprehensive list of papers (http://www.rbans.com/publications.html), including a summary of papers demonstrating clinical validity: http://www.rbans.com/clinicalvalidity.html - although does not seem to have been updated since about 2009. Arch, A. & Ferraro, F. R. (2019) Performance on the Repeatable Battery for the Assessment of Neuropsychological Status in college students with mild traumatic brain injury. *Applied Neuropsychology: Adult*, DOI: 10.1080/23279095.2019.1626236 Calamia, M., Roye, M., & Lemke, A. (2017). Does prior administration of the RBANS influence performance on subsequent neuropsychological testing? *Applied Neuropsychology: Adult,* 1-4. http://dx.doi.org/10.1080/23279095.2017.1299736 Dickerson, F B., Stallings, C., Origoni, A., Boronow, J. J., Sullens, A., & Yolken, R. (2008). Predictors of occupational status six months after hospitalization in persons with a recent onset of psychosis. *Psychiatry Research, 160,* 278-284. Duff, K., Hobson, V. L., Beglinter, L. J., & O'Bryant, S. E. (2010). Diagnostic accuracy of the RBANS in mild cognitive impairment: Limitations on assessing milder impairments. *Archives of Clinical Neuropsychology 25*, 429-441. Duff, K., Humphreys Clark, J. D., O'Bryant, S. E., Mold, J. W., Schiffer, R. B. & Sutker, P. B. (2008). Utility of the RBANS in detecting cognitive impairment associated with Alzheimer's disease: Sensitivity, specificity, and positive and negative predictive powers. *Archives of Clinical Neuropsychology, 23*, 603-612. Duff, K., Spering, C. C., O'Bryant, S. E., Beglinger, L. J., Moser, D. J., Bayless, J. D. et al. (2011). The RBANS Effort Index: Base rates in geriatric amples. *Applied Neuropsychology, 18*, 11-17. Faust, K., Nelson, B. D., Sarapas, C., & Pilskin, N. H. (2017). Depression and performance on the Repeatable Battery for the Assessment of Neuropsychological Status. *Applied Neuropsychology: Adult, 24*, 350-356, DOI: 10.1080/23279095.2016.1185426 Goette, W. F. & Goette, H. E. (2019) A meta-analysis of the accuracy of embedded performance validity indicators from the Repeatable Battery for the Assessment of Neuropsychological Status. *The Clinical Neuropsychologist, 33*, 1044-1068, DOI: 10.1080/13854046.2018.1538429 Gogos, A., Joshua, N., & Rossell, S. L. (2010). Use of the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) to investigate group and gender differences in schizophrenia and bipolar disorder. *Australian and New Zealand Journal of Psychiatry, 44*, 220-229. Goudsmit, M., van Campen, J., Schilt, T., Hinnen, C., Franzen, S. & Schmand, B., (2018). One size does not fill all: Comparative diagnostic accuracy of the Rowland Universal Dementia Assessment Scale and the Mini Mental State Examination in a memory clinic population with very low education. *Dementia and Geriatric Cognitive Disorders Extra, 8*, 290–305. Green, S., Sinclair, E., Rodgers, E., Birks, E., & Lincoln, N. (2013). The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) for post-stroke cognitive impairment screening. *International Journal of Therapy and Rehabilitation, 20*, 536-542. Heyanka, D. J., Scott, J. G., & Adams, R. (2015). Improving the Diagnostic Accuracy of the RBANS in mild cognitive impairment with construct-consistent measures. *Applied Neuropsychology: Adult, 22*, 32-41. DOI: 10.1080/23279095.2013.827574 Hobson, V. L., Hall, J. R., Humphreys-Clark, J. D., Schrimsher, G. W. & O'Bryant, S. E. Identifying functional impairment with scores from the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS). *International Journal of Geriatric Psychiatry, 25*, 525-530. Holzer, L., Chinet, L., Jaugey, L., Plancherel, B., Sofiea, C., Halfon, O., & Randolf, C., (2007). Detection of cognitive impairment with the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) in adolescents with psychotic symptomatology. *Schizophrenia Research*, 95*, 48-53.* Iverson, G. L., Brooks, B. L., & Haley, G. M. T. (2009). Interpretation of the RBANS in inpatient psychiatry: Clinical normative data and prevalence of low scores for patients with schizophrenia. *Applied Neuropsychology, 16*, 31-41. Karantzoulis, S., Novitski, J., Gold, M., & Randolph, C. (2013). The Repeatable Battery for the Assessment of Neuropsychological Status (RBANS): Utility in detection and characterization of mild cognitive impairment due to Alzheimer's Disease. *Archives of Clinical Neuropsychology, 28*, 837-844.

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Rivermead Behavioural Memory Test (RBMT)	Manuals (these provide a lot of psychometric information): Wilson, B. A., Cockburn, J., & Baddely, A. (2003). *The Rivermead Behavioural Memory Test – Second Edition*. London, England: Harcourt Assessment. Wilson, B. A., Cockburn, J., Baddely, A., & Hiorns, R. (2003). *The Rivermead Behavioural Memory Test – Second Edition, Supplement Two*. London, England: Harcourt Assessment. Wilson, B. A., Greenfield, E., Clare, L., Baddeley, A., Cockburn, J., Watson, P., et al., (2008). *The Rivermead Behavioural Memory Test – Third Edition*. London, England: Pearson Assessment. Psychometrics: Bollo-Gasol, S., Pinol-Ripoll, G., Cejudo-Bolivar, J. C., Llorente-Vizcaino, A., & Peraita-Adrados, H. (2014). Ecological assessment of mild cognitive impairment and Alzheimerdisease using the Rivermead Behavioural Memory Test. *Neurologia, 29*, 339-345. Cockburn, J., & Smith, P.T. (2003) *The Rivermead Behavioural Memory Test – Second Edition, Supplement Three, Elderly People*. London, England: Harcourt Assessment. Higginson, C. I., Arnett, P. A., & Voss, W. D. (2000). The ecological validity of clinical tests of memory and attention in multiple sclerosis. *Archives of Clinical Neuropsychology, 15*, 185-204. Wester, A.J., Leenders, P., Egger, J., & Kessels, R. (2013). Ceiling and floor effects on the Rivermead Behavioural Memory Test in patients with alcohol related memory disorders and healthy participants. *International Journal of Psychiatry in Clinical Practice,* 17, 286–291. Wester, A.J., van Herten, J., Egger, J., Kessels, R. (2013). Applicability of the Rivermead Behavioural Memory Test – Third Edition (RBMT-3) in Korsakoff's syndrome and chronic alcoholics. *Neuropsychiatric Disease and Treatment,* 9, 875-881.
Rowland Universal Dementia Assessment Scale **(RUDAS)**	Manual/Test Administration: https://www.dementia.org.au/resources/rowland-universal-dementia-assessment-scale-rudas Basic, D., Rowland, J. T., Conforti, D. A., Vrantsidis, F., Hill, K. LoGiudice, D. et al. (2009). The validity of the Rowland Universal Dementia Assessment Scale (RUDAS) in a multicultural cohort of community-dwelling older persons with early dementia. *Alzheimer Disease and Associated Disorders, 23*, 124-129. Basic, D., Khoo, A., Conforti, D., Rowland, J., Vrantsidis, F., Logiudice, D., et al (2009). Examination and general practitioner assessment of cognition in a multicultural cohort of community-dwelling older persons with early dementia. *Australian Psychologist, 44*, 40-53.

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Swanson Cognitive Processing Test (S-CPT)	Manual: Swanson, H. Lee. (1996). Swanson Cognitive Processing Test (SCPT). Austin, Texas: PRO-ED Inc. Psychometrics: Swanson, H. L. (2000). Swanson-Cognitive Processing Test: Review and applications. In Lidz, C. S. and Elliott, J. G. (Eds.), *Advances in Cognition and Educational Practice, Volume 6, Dynamic Assessment: Prevailing Models and Applications* (pp. 71-108). New York: Elsevier Science Inc. Trainin, G., & Swanson, H. L. (2005). Cognition, metacognition, and achievement of college students with learning disabilities. *Learning Disability Quarterly, 28*, 261-272.
SIMARD-MD (Screen for the Identification of Cognitively Impaired Medically At-Risk Drivers, a Modification of the DemTect)	Psychometrics: Bedard, M., Marshall, S.,Man-Son-Hing, M., Weaver, B., Gelinas, I., Korner-Bitenski, N., Bazur, B., Naglie, G., Porter, M.M., Rapoport, M.J., Tuokko, H., & Vrkljan, B. (2013). It is premature to test older drivers with the SIMARD-MD. *Accident:Analysis and Prevention,* April 9, 2013 date of electronic publication. Dobbs, B.M., & Schopflocher, D. (2010). The introduction of a new screening tool for the identification of cognitively impaired medically at-risk drivers: The SIMARD a modification of the DemTect. *Journal of Primary Care & Community Health, 1*, 119-127. (Available at https://www.ualberta.ca/medically-at-risk-driver-centre/simard-md/simardmdpublication, accessed June 10, 2018.) Dobbs, B. M. & Schopflocher, D. (2011). Evaluating the SIMARD MD a new screening tool to identify cognitively impaired drivers: A leap forward. *Journal of Primary Care & Community Health, 2*, 136-137. (Available at https://www.ualberta.ca/medically-at-risk-driver-centre/simard-md/simardmdpublication, accessed June 10, 2018.) Wernham, M., Jarrett, P. G. Stewart, C., MacDonald, E., MacNeil, D., & Hobbs, C. (2014). Comparison of the SIMARD MD to clinical impression in assessing fitness to drive in patients with cognitive impairment. *Canadian Geriatrics Journal, 17*, 63-69.
Symbol Digit Modalities Test (SDMT)	Manual: Smith, A. (1982). *Symbol Digit Modalities Test*. Los Angeles (CA): Western Psychological Services. Psychometrics (sampling of the literature): Akbar, N., Honarmand, K., Kou, N., & Feinstein, A. (2011). Validity of a computerized version of the Symbol Digit Modalities Test in multiple sclerosis. *Journal of Neurology, 258*, 373-379. Benedict, R., Smerbeck, A., Parikh, R., Rodgers, J., Cadavid, D., & Erlanger, D.(2012). Reliability and equivalence of alternate forms for the Symbol Digit Modalities Test: implications for multiple sclerosis clinical trials. *Multiple Sclerosis Journal, 18*, 1320–1325.

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Test for Nonverbal Intelligence (TONI) – A language-free measure of cognitive ability	Manual (***note***: the kit for TONI-3 is no longer available for purchase, but TONI-4 is available) Brown, L., Sherbenou, R. J., & Johnsen, S. K. (1997). *Examiner's manual: Test of Nonverbal Intelligence, A Language-Free Measure of Cognitive Ability. Third Edition (TONI-3)*. Austin, Texas: PRO-ED Inc. Brown, L., Sherbenou, R. J., & Johnsen, S. K. (2010). *TONI-4: Test of Nonverbal Intelligence, Fourth Edition*. Psychometrics: McGhee, R. L., & Lieberman, L. R. (1990). Test-retest reliability of the Test of Non-Verbal Intelligence (TONI). *Journal of School Psychology, 28, 351-353.*

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