



# CANADIAN STROKE BEST PRACTICE RECOMMENDATIONS

## MOOD, COGNITION AND FATIGUE FOLLOWING STROKE

**Table 1A: Selected Validated Screening and Assessment Tools for Post-Stroke Depression**

**Update 2019**

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**Table 1A: Selected Validated Screening and Assessment Tools for Post-Stroke Depression**

This table provides a summary of the psychometric properties of a selected set of screening and assessment tools that have been validated for use with stroke patients, or frequently reported in the stroke literature. This list is not exhaustive, rather it highlights the more commonly used and validated tools. It is recommended that these tools be considered as first line options for all stroke services. (Table completed by Katherine Salter, PhD candidate with thesis research in Post-Stroke Depression).

Notes:

- It should be emphasized that a score indicating depression on a screening tool is not equivalent to a diagnosis of depression. Rather, a positive score indicates the need for further follow-up and assessment
- A more detailed review of these screening tools may be obtained via the ebsr.com, strokengine.com or in Salter et al. (2007).

Assessment Tool and Link	# of Items	Response Format	Total Score	Stroke-specific reliability/validity	Interpretation of Scores*	Sensitivity/Specificity for PSD
<b>Recommended First Line Tools</b>						
<b>Geriatric Depression Scale (GDS)</b> <a href="http://web.stanford.edu/~ye savage/GDS.html">http://web.stanford.edu/~ye savage/GDS.html</a>	30	Self-report Yes/No responses	0-30	<b>Reliability:</b> Though thoroughly evaluated in populations of elderly individuals, relatively little has been done specific to individuals with stroke. Agrell and Dehlin (1989) reported high internal consistency ( $\alpha=0.90$ ) as did Sivrioglu et al. (2009) ( $\alpha=0.88$ ). <b>Concurrent Validity:</b> Agrell and Dehlin (1989) reported good correlations between GDS scores and scores on self-report and observational depression assessment scales. <b>Discriminative Validity:</b> Sivrioglu et al. (2009) demonstrated significant differences in GDS scores between groups of depressed vs. non-depressed participants ( $p<0.001$ ).	Normal = 0 – 10, scores $\geq 11$ indicate presence of depression; 11-20 = mild depression, 21-30 = moderate to severe depression (McDowell et al. 1996)	Many studies have examined the relative sensitivity and specificity of the GDS – most have reported sensitivity and specificity values $> 80\%$ (Stiles and McGarrahan (1998). Within the stroke population, Johnson et al. (1995) using a cut-off of 10/11, Johnson et al. (1995) reported sensitivity = 85%, specificity = 66% and a misclassification rate of 29%. More recently, using DSM-IV-TR as the criterion for diagnosis, Sivrioglu et al. (2009) reported sensitivity = 69% & specificity = 75% for using a cutoff point of 10/11, and sensitivity = 66% and specificity = 79% for a cut off of 11/12.
<b>Hospital Anxiety and Depression Scale (HADS)</b> <a href="http://www.strokengine.ca/assessment/hads/">http://www.strokengine.ca/assessment/hads/</a>	14 (2 x 7-item sub-scales)	Self-report Multiple choice response options graded on a 4 pt scale	0-42 (0-21 for each subscale)	<b>Reliability:</b> Visser et al (1995) reported test retest reliability (0.87); reported internal consistency reliability for the depression portion of the HADS has been $>0.70$ (Johnston et al. 2000, Aben et al. 2002); most recently Sagen et al (2009) reported $\alpha=0.83$ .	Scale authors recommended either 8/9 (high sensitivity) or 10/11 (high specificity) be used to identify the presence of depression using the depression	Aben et al. (2002) reported sensitivity of 72.5% and specificity of 78.9% for the HADS-D, using a cut-off score of $\geq 7$ . For the total scale, using a cut-off of $\geq 11$ , sensitivity and specificity were 86.8% and 69.9% respectively.  Johnson et al. (1995) used a cut-off of 4/5 for the HADS-D and demonstrated a sensitivity of 93% and specificity of 44%

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				<p><b>Construct validity:</b> Reported satisfactory on confirmatory factor analysis (Johnston et al. 2000).</p> <p><b>Discriminative validity:</b> HADS-D and HADS-A scores obtained by stroke patients differed significantly from controls (<math>p &lt; 0.001</math>) (Visser et al. 1995).</p>	<p>subscale of the HADS (Zigmond and Snaith 1983). Alternate cut-off points have been evaluated for the post stroke population.</p>	<p>while O'Rourke et al. (1998) reported sensitivity of 80% and specificity of 79% using the same cut-off point as Aben et al.</p> <p>More recently, Sagen et al. (2009) reported sensitivity and specificity for the HADS-total (relative to the DSM-IV) of 90% and 83% (cut off <math>\geq 11</math>), 79% and 85% (cut off <math>\geq 12</math>) respectively.</p> <p>For the HADS-D, sensitivity = 79% and specificity = 82% (cut off <math>\geq 5</math>). AUC for HADS-D was 0.87 (95% CI 0.78-0.96) and for HADS-total 0.91 (95% CI 0.85-0.97) (Sagen et al. 2009)</p>
<p><b>Patient Health Questionnaire -9 (PHQ-9)</b></p> <p><a href="http://strokengine.ca/assess/module_phq9_intro-en.html">http://strokengine.ca/assess/module_phq9_intro-en.html</a></p> <p><a href="http://www.phqscreeners.com/">http://www.phqscreeners.com/</a></p>	9	Multiple choice response options, 4pt scale	0-27	<p><b>Reliability:</b> Inter-rater reliability = 0.98, test re-test = 0.75 and internal consistency = 0.79 (de Man-van Ginkel et al. 2012).</p> <p><b>Concurrent validity:</b> PHQ-9 was significantly correlated with GDS-15 scores (<math>r = 0.8</math>, <math>p &lt; 0.01</math>) (de Man-van Ginkel et al. 2012).</p>	<p>Scores <math>\geq 10</math> (sensitivity=80%, specificity=78%) for identification of PSD 6-8 weeks post stroke (deMan van Ginkel et al. 2012)</p>	<p>A single study evaluated the sensitivity and specificity of the PHQ-9 for both major depression and any depression against a structured clinical interview in a subgroup of outpatients with stroke who endorsed either 2 or more symptoms on the PHQ-9 or either of the PHQ-2 items at study baseline (Williams et al. 2005). The authors reported sensitivity of 91% and specificity of 89% for major depression as well as sensitivity of 78% and specificity of 96% for any depression associated with a cut-off score <math>\geq 10</math>. These numbers may, however, have been influenced by the pre-screening (using items from the PHQ-9) and formal assessment of selected individuals only. De Man-vanGinkel et al. (2012) also reported the results of a validation study that evaluated the PHQ-9 against the results of a composite international diagnostic interview for the DSM-IV conducted with 164 individuals with stroke (outpatients approximately 6-8 weeks post stroke). Similar to Williams et al., the authors reported that the accuracy of the PHQ-9 was best using a cutoff of <math>\geq 10</math> with a sensitivity of 80% and specificity of 78%. Using the PHQ-9 in patients pre-screened with the PHQ-2 increased the accuracy of identification (sensitivity = 87%) (de man-van Ginkel et al. 2012).</p>

Assessment Tool and Link	# of Items	Response Format	Total Score	Stroke-specific reliability/validity	Interpretation of Scores*	Sensitivity/Specificity for PSD
<b>Additional Tools for Consideration</b>						
<b>Beck Depression Inventory (BDI-II)</b>  <a href="http://strokengine.ca/assess/module_bdi_intro-en.html">http://strokengine.ca/assess/module_bdi_intro-en.html</a>  <a href="http://www.pearsonassessments.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=015-8018-370">http://www.pearsonassessments.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=015-8018-370</a>	21	Self-report Multiple-choice response set graded for severity	0-63	<b>Reliability:</b> Aben et al. (2002) confirmed high internal consistency reliability of the BDI in a population of individuals with stroke. Outside of the stroke population estimates of internal consistency tend to exceed 0.80 (Beck et al. 1988) <b>Predictive validity:</b> BDI scores are predictive of functional recovery and need for institutional care following stroke (Kotila et al. 1999, Desrosiers et al. 2002).	Threshold for presence of depression = 10; 10 – 18 = mild depression, 19 – 29 = moderate depression, 30 – 63 = severe depression (Beck et al. 1988)	ROC analysis completed by Lincoln et al. (2003) suggests that the accepted cut-off point indicative of presence of depression might be too low – recommends 15/16 to optimize sensitivity; however, specificity is reduced relative to the DSM-III-R. Aben et al. (2002) reported the standard cut-off points to be acceptable for used for individuals with stroke.
<b>Center for Epidemiological Studies Depression Scale (CES-D)</b>  <a href="http://cesd-r.com/">http://cesd-r.com/</a>	20	Self-report 4-pt scale	0-60	<b>Reliability:</b> Internal consistency reliability has been reported ranging from 0.64-0.86 (Agrell & Dehlin 1989, Toedter et al. 1995). Reported item-to-total correlations ranged from 0.39-0.75 (Shinar et al. 1986). <b>Concurrent validity:</b> Results of the CES-D used to assess individuals with stroke have correlated significantly with results of other standardized self-report and observational depression assessment tools (Agrell and Dehlin 1989, Shinar et al. 1986, Parikh et al. 1988)	Presence of depression = $\geq 16$ (Radloff et al. 1977)	Using the suggested cut-off score, Shinar et al. 1986 and Parikh et al. 1988 reported sensitivity of 73% and 86%, and specificity of 100% and 90% respectively (relative to the DSM-III-R)
<b>Depression, Obstructive sleep apnea and Cognitive impairment (DOC) Screen</b>  <a href="http://www.docscreen.ca/">http://www.docscreen.ca/</a>	16	Self-report	20	<b>Feasibility:</b> 89% of patients completed the screen in 5 minutes or less (mean 4.2 minutes; 9% CI: 4.1 to 4.3 mins). (Swartz et al. 2017) Time to complete was significantly higher in patients with stroke compared to those with TIA.  <b>Validity:</b> The DOC showed excellent diagnostic characteristics for the Patient Health Questionnaire-2 (PHQ-2), STOP, and Montreal Cognitive Assessment (MoCA) components. (Swartz et al. 2017)  <b>Area Under the Curve (AUC):</b> Doc-Mood: 0.90 Doc-Apnea: 0.80	<b>Doc-Mood:</b> Score 0 indicated low-risk for depression. Scores $\geq 4$ indicated high-risk of depression;  <b>Doc-obstructive sleep apnea (OSA):</b> Score 0 indicated low-risk for OSA; scores 1 to 3 indicated intermediate risk for OSA; Score 4 indicated high-risk for OSA	<b>Sensitivity and specificity</b> Doc-Mood: Sensitivity 92%; and specificity: 99% Doc-Apnea: Sensitivity: 91%; specificity: 93% Doc-Cog: Sensitivity 96%; specificity 91%  For DOC-Mood, 29% of those scoring in the intermediate-risk were impaired according to the SCID-D; therefore, clinicians may want to use caution for patients scoring at intermediate-risk depression by applying more detailed screening tools or pairing with additional clinical questions. (Swartz et al. 2017)  Doc-Cog has a low Positive Predictive Value, suggesting that Doc-Cog is more

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				Cog-Cognitive impairment (Cog): 0.81	<b>DOC-Cog:</b> Score of 10 indicated low-risk of cognitive impairment; scores 6 to 9 indicated intermediate risk for cognitive impairment; scores $\leq 5$ were classified as high-risk for cognitive impairment	reliable to rule out moderate-severe impairment than for ruling it in.
<b>Tools to Consider for Aphasic Patients</b>						
<b>Stroke Aphasic Depression Questionnaire-10 (SADQ-10)</b>  <a href="http://strokengine.ca/assess/module_sadq_intro-en.html">http://strokengine.ca/assess/module_sadq_intro-en.html</a>  <a href="http://www.nottingham.ac.uk/medicine/about/rehabilitation/publishedassessments.aspx">http://www.nottingham.ac.uk/medicine/about/rehabilitation/publishedassessments.aspx</a>	10	Observer rating of observed behaviour 4-point scale	30	<b>Reliability:</b> Using carers of individuals with aphasia to complete follow-up assessments, 4-week test-retest reliability was reported to be 0.69 for the SADQ-10 (Sutcliffe and Lincoln 1998). Internal consistency has been reported as $\alpha = 0.80$ (Sutcliffe and Lincoln 1998, Lincoln and Sutcliffe 2000). <b>Construct validity:</b> Results of factor analysis suggested that the SADQ-10 items may be unidimensional (Sutcliffe and Lincoln 1998) <b>Concurrent validity:</b> SADQ-10 scores have been positively associated with scores on the HADS-D, HADS-A, Wakefield Depression Inventory (Sutcliffe and Lincoln 1998), and the GDS-15 (Leeds et al. 2004), though correlations with healthcare professional ratings have varied (Lincoln and Sutcliffe 2000).	Scores $\geq 15$ may represent presence of depression (Leeds et al. 2004).	Using the suggest cut-off score of $\geq 15$ , Leeds et al. (2004) reported sensitivity = 70% and specificity = 77% in a group of stroke rehabilitation inpatients. Based around cut-offs used for the HADS, Bennett et al. (2006) identified a cut-off of 17/18 on the SADQ-H (sensitivity= 100% and <u>specificity</u> =81%), and an optimum cut-off of 5/6 on the SADQ-H 10 (sensitivity = 100% and specificity = 78%).
<b>Aphasia Depression Rating Scale (ADRS)</b>  <a href="http://strokengine.ca/assess/module_adrs_intro-en.html">http://strokengine.ca/assess/module_adrs_intro-en.html</a>	9	Observer rating based on interview & observation Rating scale varies per item	0-32	<b>Reliability:</b> Test retest reported to be 0.89 by scale authors. Interobserver reliability = 0.89 (Benaim et al. 2004). <b>Concurrent validity:</b> ADRS scores were correlated with CAS ratings and with results of HRSD (Benaim et al. 2004).	Scores of $\geq 9$ are used to indicate the presence of depression (Benaim et al. 2004).	Using the cut-off indicated as appropriate by the scale author, sensitivity of 83% and specificity of 71% were reported (relative to a psychiatric diagnosis) (Benaim et al. 2004).

Assessment Tool and Link	# of Items	Response Format	Total Score	Stroke-specific reliability/validity	Interpretation of Scores*	Sensitivity/Specificity for PSD
<b>Tools for Consideration in Children</b>						
<b>Children's Depression Inventory (CDI)</b>  <a href="http://www.mhs.com/products.aspx?gr=edu&amp;id=overview&amp;prod=cdi2#description">http://www.mhs.com/products.aspx?gr=edu&amp;id=overview&amp;prod=cdi2#description</a>  (The CDI 2 has been recently released but test details are not available free of charge)	27	Self-report 3 pt scale	0-54	The psychometric properties of this scale have not been investigated within a stroke-specific population.	Scores of $\geq 19$ have been identified as representing the 90th percentile within a general population of children in grades 3-9 (Smucker et al. 1986).	n/a
<b>Kidscreen 52 (Generic HRQL measure)</b>  <a href="http://www.kidscreen.org/">http://www.kidscreen.org/</a>	52	Self-report 5 pt scale	Scores for each dimension are calculated as T-values (mean=50 ; SD=10).	The psychometric properties of this scale have not been investigated within a stroke-specific population.	Higher scores indicate higher Health-Related Quality of Life and well-being.	n/a

- It should be emphasized that a score indicating depression on a screening tool is not equivalent to a diagnosis of depression. Rather, a positive score indicates the need for further follow-up and assessment
- \*\*more detailed review of these screening tools may be obtained via the ebrsr.com, strokengine.com or in Salter et al. (2007)

## References for Tables 1A

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