### Table 3: Canadian Stroke Best Practice Recommendations
Swallow Screening and Assessment Tools

<table>
<thead>
<tr>
<th>Author/Name of test</th>
<th>Components of test</th>
<th>Details of validation study</th>
<th>Results of original validation study</th>
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<tbody>
<tr>
<td>Daniels et al. 1997</td>
<td>“Any Two”</td>
<td>Items included: 6 clinical features- dysphonia, dysarthria, abnormal volitional cough (includes water-swallowing test), abnormal gag reflex, cough after swallow and voice change after swallow were assessed. Scoring: Presence of any 2 of the items distinguished patients with/without dysphagia. Sample: 59 acute stroke survivors were studied within 5 days of hospital admission.</td>
<td>Diagnostic standard: VMBS exam Prevalence of dysphagia: 74.6% The sensitivities and specificities of individual items ranged from 31%-76.9% and 61%-88%, respectively. Overall: Sensitivity: 92% Specificity: 67%</td>
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<td>Trapl et al. 2007</td>
<td>The Gugging Swallowing Screen (GUSS)</td>
<td>Preliminary Assessment (vigilance, throat clearing, saliva swallow) Direct swallow ( semisolid, liquid, solid swallow trials) Scoring: Total scores ranged from 0 (worst) - 20 (no dysphagia). A cut-off score of 14 was selected Sample: 50 first-ever acute stroke patients with suspected dysphagia</td>
<td>Diagnostic standard: fiberoptic endoscopic evaluation using the Penetration Aspiration Scale to interpret the results. Prevalence of dysphagia: 73% First group of 19 patients using the GUSS to identify subjects at risk of aspiration: Sensitivity: 100%, Specificity: 50% Second group of 30 patients Sensitivity: 100% Specificity: 69% Interrater reliability: Kappa=0.835</td>
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<td>Martino et al. 2009</td>
<td>The Toronto Bedside Swallowing Screening Test (TOR-BSST)</td>
<td>Items included: presence of dysphonia before/after water swallowing test, impaired pharyngeal sensation and abnormal tongue movement. Scoring: pass=4/4 items; fail ≥1/4 items Sample: 311 stroke patients (103 acute, 208 rehabilitation)</td>
<td>Diagnostic standard: VMBS exam. Prevalence of dysphagia: 39% Sensitivity: 96% Specificity: 64% Interrater reliability (based on observations from 50 subjects) ICC =0.92 (95% CI: 0.85-0.96)</td>
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<td>Edmiaston et al. 2009</td>
<td></td>
<td>Items included: Glasgow Coma Scale score &lt;13, presence of facial, tongue or palatal asymmetry/weakness. If no to all 3 items, then proceed</td>
<td>Diagnostic standard: Mann Assessment of Swallowing Ability (MASA),</td>
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| USA ⁶                 | Acute Stroke Dysphagia Screen | to 3 oz water swallowing test.  
Scoring: If there is evidence of change in voice quality, cough or change in vocal quality 1 minute after water swallowing test = fail.  
Sample: 300 acute stroke patients screened by nurses within 8 to 32 hours following admission. | performed by a SPL.  
Prevalence of dysphagia: 29%  
Sensitivity (Dysphagia): 91%  
Specificity: 74%  
Sensitivity (aspiration risk): 95%  
Specificity: 68%  
Interrater reliability: Kappa=94% |
| Turner-Lawrence et al. 2009 ⁷ | Emergency Physician Dysphagia Screen | The two-tiered bedside tool was developed by SLPs.  
Tier 1 items included: voice quality, swallowing complaints, facial asymmetry, and aphasia.  
Tier 2 items included a water swallow test, with evaluation for swallowing difficulty, voice quality compromise, and pulse oximetry desaturation (≥ 2%).  
Patients failing tier 1 did not move forward to tier 2.  
Scoring: Patients who passed both tiers were considered to be low-risk.  
Sample: a convenience sample of 84 stroke patients (ischemic/hemorrhagic) screened by 45 ER MDs. | Diagnostic standard: formal assessment conducted by an SLP  
Prevalence of dysphagia: 57%  
Sensitivity: 96%  
Specificity: 56%  
Interrater reliability: Kappa=0.90 |
| Antonios et al. 2010 ⁸ | Modified Mann Assessment of Swallowing Ability (MMASA) | 12 of the 24 MASA items were retained including: alertness, co-operation, respiration, expressive dysphasia, auditory comprehension, dysarthria, saliva, tongue movement, tongue strength, gag, volitional cough and palate movement.  
Scoring: Maximum score is 100 (no dysphagia). A cut-off score of 94 was used to identify patients at risk of dysphagia  
Sample: 150 consecutive patients with acute ischemic stroke were assessed by 2 neurologists shortly after admission to hospital. | Diagnostic standard: MASA conducted by SLP  
Prevalence of dysphagia: 36.2%  
Sensitivity: 87% & 93%  
Specificity: 86% & 84%  
Interrater reliability: Kappa=0.76 |
| Schrock et al. 2011 ⁹ | MetroHealth Dysphagia Screen | 5 Items included: Alert and able to sit upright for 10 minutes, weak, wet or abnormal voice, drooling, slurred speech and weak, or inaudible cough.  
Scoring: ≥1 items answered yes=failed screen  
Sample: 283 patients admitted to the Emergency department with acute | Diagnostic standard: VMBS Prevalence of dysphagia at 30 days: 32%  
Sensitivity: 95%  
Specificity: 55% |
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<td>stroke and screened for the presence of dysphagia by nurses</td>
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<td>Interrater reliability: Kappa=0.69</td>
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Reference List


