Stroke is the leading cause of serious adult long-term disability in the United States with the estimated cost of $33 billion dollars annually.1,2 Dysphagia, or impaired swallowing, is a common complication of acute stroke with an incidence that ranges from 37% to 78%.3 Dysphagia is associated with aspiration, pneumonia, and malnutrition and remains challenging to identify at the bedside. It has been estimated that approximately half of all aspiration caused by dysphagia goes unrecognized.3 With the aging of adults in the United States, there is a critical need to focus on the early detection of dysphagia symptoms in hospitalized patients who experienced a stroke, accompanied by the initiation of a validated dysphagia screening protocol (DSP).4 This article will provide an update of the most commonly used DSPs and will provide guidance in the selection of a DSP for use in nursing.

Clinical Practice Recommendations for Nursing
Nurses, on the forefront of stroke care delivery, maintain a key role in early identification of patients with dysphagia. Although the Joint Commission no longer requires dysphagia screening rates to be reported for stroke center certification, the Joint Commission encourages consistent monitoring for dysphagia and use of evidence-based DSPs.5

Recommendations from the American Heart Association declare that a swallow evaluation should be performed in the first 24 hours after stroke.6 Physician order sets should include a swallow assessment with nutrition and swallow evaluation before oral intake. Patients who cannot swallow should have a nasogastric tube placed or endoscopic gastrostomy tube depending on severity. Patients should be kept NPO (nil per os or nothing by mouth) with intravenous normal saline running at a rate of 75 to 100 mL/h until a formalized evaluation by speech-language pathologist (SLP; Class I; Level of Evidence B). When a formal evaluation cannot be completed by SLP before oral intake is required, other members of the multidisciplinary team may perform a swallow screen. Nurses, who are typically at the patient bedside for extended periods of time and often first to provide oral medications or nutrition, should be familiar with DSPs.6

Essential Considerations for Nurses When Selecting an Evidence-Based Dysphagia Screen
Hinchey et al7 published that the use of a formal DSP is associated with decreased risk for aspiration pneumonia. Therefore, in collaboration with a multidisciplinary team, nurses should identify an evidence-based DSP to reduce aspiration in hospitalized patients who experienced a stroke. Numerous behaviors are associated with aspiration and should be considered when selecting a protocol. These symptoms include choking, coughing, a wet voice, a delay in initiating swallow, uncoordinated chewing or swallowing, and extended time eating or drinking.3 Further signs include weight decrease, sore throat after meals, food storing in the oral cavity, and presence of recurrent pneumonia. If these symptoms are identified, patients should also be considered for aspiration precautions and DSP.9

Identification of Standardized Assessment for Dysphagia Poststroke
The VFSS (Videofluoroscopic Swallowing Study) is the standard assessment for dysphagia.8 The VFSS is commonly conducted in hospitals by radiology and SLP. It provides the most comprehensive information on anatomic and physiological malfunction in swallowing.10 However, because of availability, cost, patient compliance, and expertise needed by SLP, it is not possible to perform instrumental examination on every patient with suspected dysphagia. Therefore, several less invasive DSPs conducted by various members of the healthcare team have been developed with varying degrees of acceptance.9,10

Various meta-analysis reviews have been performed on published DSPs in the past 5 years with differing recommendations and no consensus. First, O’Horo et al9 published a meta-analysis in 2015 that identified over 800 articles referencing various screening and assessment tools. Their results showed that most DSPs lack the sensitivity to be used across all patient populations. They also identified that no DSP has been shown to provide adequate predictive value for the presence of aspiration.9 Second, Shepp et al11 performed a systematic review of DSPs after stroke and identified several criteria that established relevancy. These criteria include having consistently reliable data, validity against a radiographic study, and a complete published description of the tool.11 Further, Daniels et al8 published that there have been numerous studies published in the last decade that identified clinical features associated with dysphagia poststroke and should be considered for DSPs, but...
the quality of the studies are variable and have not provided a uniform DSP recommendation. DSPs referenced by these authors are summarized in Table. According to the American Speech-Language-Hearing Association (ASHA), screening tests should include an assessment capturing a history of dysphagia, a medical diagnosis that affects swallowing (ie, stroke), overt signs of aspiration, complaints of swallowing difficulties, and a pass or fail recommendation. Further, observation of patient’s alertness, signs of motor speech, and voice abnormalities, signs of dysphagia with and without the presentation of food and water, and overall assessment of risk factors should be included. On training recommendations, ASHA recommends that SLP trains nurses to conduct initial swallow screenings and makes referrals based on these finds to SLP as appropriate. Patient and process outcomes should be considered when measuring effectiveness of the screening tool selected. These measurements may include: how many patients were kept NPO until initial screening, frequency of screenings throughout hospitalization, and how many patients experienced complications, such as aspiration, related to dysphagia post-screening.

The DSPs referenced in Table may be considered when selecting a validated tool. The Yale Swallow Protocol, Toronto Bedside Swallow Screen, and the Barnes Jewish Hospital Stroke Dysphagia Screen are evidence-based DSPs validated for use by nurses in the clinical setting. The Toronto Bedside Swallow Screen, originally published in 2008, remains a reliable and sensitive test validated against the VFSS standard for nurses to implement in the acute and rehabilitation settings. It requires a 4-hour training for nurses before utilization. The Yale Swallow Protocol is a validated, reliable, and sensitive DSP that is created for health professionals, such as nurses, to use in patients who experienced a stroke. It is a combination of the 3 oz water test and a brief cognitive assessment. The Yale Swallow Protocol is not recommended for patients who require tracheotomy, ongoing mechanical ventilation, or pulmonary toilet. The Barnes Jewish Hospital Stroke Dysphagia

### Table. Sample of Evidence-Based Dysphagia Screening Tools

<table>
<thead>
<tr>
<th>Assessment Name</th>
<th>Considerations for Implementation</th>
<th>Administration Time (in min)</th>
<th>Validation for Use by Nurses</th>
</tr>
</thead>
<tbody>
<tr>
<td>VFSS (per ASHA, highly valid, reliable, sensitive, and specific in clinical determination of aspiration and dysphagia)</td>
<td>Cost prohibitive; requires patient compliance; technician expertise; patient exposure elevated to toxic barium; often not available 24/7</td>
<td>15–60</td>
<td>No</td>
</tr>
<tr>
<td>Barnes Jewish Hospital Stroke Dysphagia Screen (also known as Acute Stroke Dysphagia Screen)</td>
<td>Validated against MASA; sensitivity for dysphagia and aspiration &gt;90%; specificity 74%; reliability 94%</td>
<td>&lt;2</td>
<td>Yes, with 10-min training</td>
</tr>
<tr>
<td>Burke Dysphagia Screening Test</td>
<td>Not valid for aspiration or dysphagia screening; lacks reliability, sensitivity, and specificity data; authors report test is for dysphagia-related medical complications not dysphagia screening; sensitivity for dysphagia-related medical complications was 92%</td>
<td>&lt;10 min</td>
<td>Yes, for dysphagia-related complications</td>
</tr>
<tr>
<td>Gugging Swallow Screen</td>
<td>Validated; reliability, sensitivity, and specificity established</td>
<td>&lt;10 min</td>
<td>No; SLP administered</td>
</tr>
<tr>
<td>Massey Bedside Swallow Screen</td>
<td>Small study; not validated against VF</td>
<td>&lt;15 min</td>
<td>Yes</td>
</tr>
<tr>
<td>Modified MASA</td>
<td>N/A (not performed by RNs). Validated; sensitivity 87% to 93%; specificity 84% to 86%; reliability 76%</td>
<td>&lt;10</td>
<td>No; published for use by physicians</td>
</tr>
<tr>
<td>Simple Swallow Provocation Test</td>
<td>Not validated by VF; low sensitivity &lt;70%, does not require patient cooperation; limited applicability</td>
<td>Variable</td>
<td>Yes; with training</td>
</tr>
<tr>
<td>Swallow screen by emergency physician</td>
<td>N/A (not performed by RNs). Validated; sensitivity 96%, specificity 56%, reliability 90%</td>
<td>&lt;3</td>
<td>No; published for use by physicians</td>
</tr>
<tr>
<td>3 oz Water Test</td>
<td>Validated in &gt;1 study; questionable reliability unless combined with other tests. Specificity established; sensitivity &lt;80% for aspiration</td>
<td>&lt;5</td>
<td>Yes</td>
</tr>
<tr>
<td>Toronto Bedside Swallow Screening</td>
<td>Validated for use across clinical settings (copyright protected); sensitivity 96%; specificity 64%; reliability 92% (adherence to copyright protections required)</td>
<td>&lt;10</td>
<td>Yes, with 4 h training</td>
</tr>
<tr>
<td>Yale Swallow Protocol</td>
<td>Validated: reliable and useful; not recommended for patients who require tracheotomy, ongoing mechanical ventilation, or pulmonary toilet; sensitivity 100%; specificity 64%; reliability 100%</td>
<td>Simple clinical screen</td>
<td>Yes</td>
</tr>
</tbody>
</table>

ASHA indicates American Speech-Language-Hearing Association; MASA, Mann Assessment of Swallowing Ability; N/A, not available; RN, registered nurse; SLP, speech-language pathologist; VF, videofluoroscopy; and VFSS, Videofluoroscopic Swallowing Study.
Screen, also known as the Acute Stroke Dysphagia Screen, is evidence based and validated for use by nurses in the clinical setting. It requires a 10-minute training before use and can be completed in <2 minutes. Regardless of which validated tool is selected, nurses should be aware that stroke patient’s symptoms may fluctuate, and DSPs should be considered throughout the recovery process.\(^\text{19}\)

**Conclusions**

Overall, early detection of impaired swallowing is imperative to reduce complications poststroke. A multidisciplinary team, that includes nursing and SLP, should select a validated nurse administered DSP for use poststroke. Nurses recognize that no single DSP will meet the assessment needs of all multidisciplinary stroke professionals at every level of stroke care; every DSP has strengths and limitations. Therefore, because nurses are often at the bedside first and most often, they are in a position to help lead the initial DSP selection efforts. Ultimately, this review established 3 valid, reliable, sensitive, and specific tests available for use by nurses in the clinical setting. Further research is needed to investigate the long-term clinical and economic effects of the nurse validated DSPs on stroke patient outcomes.

**TAKE-HOME POINTS**

- The degree of swallow impairment may fluctuate after stroke. Nurses should use a validated swallow screening tool as part of their ongoing assessment of dysphagia poststroke.
- Nurses play a key part in working with the multidisciplinary team to develop a process for assessing dysphagia poststroke: this team should include speech-language pathologist to assist with selection, training, and proper utilization of a validated dysphagia screening protocol.
- Now that validated dysphagia screening protocols are available for nurses, additional studies should include the impact of the screenings on patient long-term outcomes poststroke.

**Disclosures**

None.

**References**


**Key Words:** gastrostomy ▶ incidence ▶ rehabilitation nursing ▶ risk factors ▶ stroke
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