

**Brief Report**

Reducing Aspiration Risk with Validated Bedside Swallowing Screening Tools

Tamara Delaney, MSN*

The Ohio State University College of Nursing, USA

*Corresponding author: Tamara Delaney, MSN, The Ohio State University College of Nursing, USA

Citation: Delaney T (2024) Reducing Aspiration Risk with Validated Bedside Swallowing Screening Tools. Int J Nurs Health Care Res 7: 1492. DOI: <https://doi.org/10.29011/2688-9501.101492>**Received Date:** 26 December, 2023; **Accepted Date:** 03 January, 2024; **Published Date:** 05 January, 2024**Abstract**

Aspiration pneumonia is a stubborn and potentially deadly subclass of pneumonia often associated with comorbidities involving the neurologic, gastrointestinal, and pulmonary systems. People receiving tube feeding are always at risk for aspiration. Patients with altered levels of consciousness due to disease conditions or sedating medications such as pain-relieving opioids are also more at risk for aspiration. Patients suffering from cognitive disorders such as Alzheimer's disease and dementia are at increased risk for aspiration and any patient newly diagnosed with a cerebrovascular accident. Some other conditions to be cognizant of are neuromuscular disorders including but not limited to Guillian barre syndrome, Amyotrophic Lateral Sclerosis (ALS), and cerebral palsy. The mortality rate for aspiration pneumonia in hospitalized patients varies greatly depending upon confounding factors but can be as high as 70% [1]. Elderly patients and infants are at a significantly higher risk for mortality. Hospital length of stay increases considerably with cases of hospital-acquired pneumonia as does the financial burden of healthcare. Bedside nurses and healthcare providers can utilize validated tools to examine a patient's ability to swallow safely and significantly decrease the risk of aspiration, thereby decreasing the risk of morbidity and mortality and improving patient outcomes. One study demonstrated an 87% decrease in healthcare-acquired pneumonia over just a six-month time frame upon implementation of one validated tool [2]. In this study, there was consistent follow-up at measured intervals to ensure both understanding of and compliance with the tool. Nurses, when provided with education and the authority to implement NPO status under nurse-driven bedside swallow screening protocols, can significantly reduce the impact of aspiration in hospitalized patients.

Keywords: Aspiration; Pneumonia; Swallow; Dysphagia; Stroke; Oral Intake; Intubated; Extubated**Background**

Aspiration pneumonia is an infection caused by inhalation of foreign substances into the lungs. Aspiration plays a role in over 57,000 deaths in the United States each year [3]. It is a potentially preventable disease process with generally higher rates of morbidity and mortality as compared to non-aspiration types of pneumonia, longer lengths of hospitalization, and higher healthcare costs. The purpose of this study is to review current literature pertaining to validated bedside swallowing tools and the potential association with reducing hospital-acquired aspiration pneumonia.

Discussion**Anatomy and Physiology**

Air enters the lungs through the airway; the airway is divided into two portions. The upper airway consists of the nasopharynx, oropharynx, and laryngopharynx. The principal function of the upper airway is the conduction of air to the lower respiratory tract. Air leaves the upper airway by way of the pharynx and enters the lower airway through the larynx. During swallowing, the uvula blocks the backflow of contents into the nasal cavity and the epiglottis folds over the larynx to prevent aspiration into the laryngeal inlet. The remaining portion of the lower respiratory tract is comprised of the trachea and bronchi, forming the tracheobronchial tree. The tracheobronchial tree has two core

functions: further conduction of air which occurs in the conducting zone of the bronchial tree and the exchange of gasses which occurs in the respiratory zone.

The trachea bifurcates at the carina into two main (primary) bronchus. Each bronchus is further subdivided into lobar (secondary) bronchi. There is one lobar bronchus for each lobe of the lung: three on the right and two on the left. The lobar bronchi divide into segmental (tertiary) bronchi followed by bronchioles. Bronchiole smooth muscles are capable of expanding and contracting to allow for increased or decreased airflow. Bronchioles separate into terminal bronchioles. Terminal bronchioles become respiratory bronchioles and the respiratory bronchioles finally become the alveoli. Structurally, the alveoli are comprised of alveolar ducts and alveolar sacs.

Pathophysiology

Aspiration occurs when gastrointestinal contents, oropharyngeal secretions, or foreign body contents enter the airway, blocking the exchange of air and causing respiratory distress. Hospital length of stay increases when a patient suffers from aspiration pneumonia and there are significant costs associated with treatment [3].

There are three basic umbrella causes of aspiration: cough or gag reflex disorders, gastrointestinal tract disorders that cause large amounts of reflux, and anatomical abnormalities. The trigeminal (cranial nerve V), Facial (cranial nerve VII), and Glossopharyngeal (cranial nerve IX) all affect a person's ability to swallow. Any condition that affects these nerves can affect a person's ability to safely swallow. Medications that cause drowsiness such as opioids, benzodiazepines, and sedatives can affect these nerves. Disease processes that have direct effects on the central nervous system or neuromuscular junction disorders can also affect swallowing. Some examples are Parkinson's disease, Guillain barre syndrome, and stroke. Gastrointestinal tract (GIT) disorders that cause large amounts of reflux can include bowel obstruction or ileus, gastroparesis, GERD, and tubes that alter the mechanical closure of the glottis such as nasogastric tubes. Anatomical abnormalities can include congenital tracheoesophageal fistula.

Symptoms

Symptoms of aspiration should be promptly reported to the patient's provider. A patient with aspiration will usually present with coughing and may have cyanosis of the lips, tongue, and fingertips. Auscultation of the lungs will sometimes reveal upper airway stridor and frequently reveal expiratory wheezing (especially in the lower airways), and decreased breath sounds, particularly on the right side. Additional symptoms will likely include tachypnea, hypoxemia, fatigue, and fever.

The nurse should anticipate facilitating testing such as chest X-ray and/or CT scan, CBC, sputum culture, blood culture, and

possibly bronchoscopy. The patient with aspiration may have a foreign body present on imaging, atelectasis, and leukocytosis. More severe cases may reveal ipsilateral mediastinal shift and tracheal displacement. Patients with any type of pneumonia can also develop sepsis. Treatment of aspiration involves administration of antibiotics and supplemental oxygen to ensure adequate oxygenation to vital organs.

Risk Factors

Risk factors for acute aspiration include a known history of swallowing difficulty, weak or absent cough or gag reflex, recent extubation, extended intubation (greater than 48 hours), and decreased level of consciousness. One study found that patients with a history of head, neck, or cervical spine tumors and/or radiation experienced a "50% incidence of clinically significant dysphagia" [4]. Signs of respiratory distress such as increasing oxygen requirements, severe tachypnea, and new conversational dyspnea are important risk factors as well. Additional signs to assess are facial weakness or asymmetry and oral motor dysfunction, laryngeal injury or edema, and insufficient voice characteristics such as whispers, low capacity, and wet sounding quality.

Methods

A literature review was conducted in multiple professional healthcare databases searching for validated bedside swallowing screening tools used in acute care settings to reduce the incidence of aspiration pneumonia. Results were limited to high-quality articles without evidence of bias and preference was given to those published in the last five years.

Results

Often, the cause of hospital-acquired pneumonia is aspiration. The primary cause of pneumonia in hospitalized stroke patients is related to dysphagia and aspiration and the risk of mortality triples in stroke patients who develop pneumonia. Utilization of a nurse-administered bedside swallowing evaluation decreased hospital-acquired pneumonia in stroke patients from 6.5% to 2.8% [5]. When Lamm et. Al [2] implemented a mandatory swallowing protocol using a 3-ounce water challenge for all elective surgical patients, they saw a reduction in healthcare-acquired pneumonia from 5.1% to 1.9% in six months (2023). In patients requiring intubation, a bedside swallow evaluation tool utilized by nurses resulted in a 16.4% decline in consultations to speech-language pathology services for swallowing assessment post-extubation [4].

Conclusion

Bedside nurses can decrease the risk of aspiration by performing routine screening of a patient's ability to swallow, especially when risk factors are present, before allowing consumption of oral intake. Implementation and utilization of a bedside swallow screening tool should be a nurse-driven protocol

where patient safety is the priority focus whenever the patient exhibits risk factors for aspiration. All patients who present with a stroke or are intubated for greater than 48 hours should be screened for swallowing safety before any oral intake as part of a comprehensive approach to safe care. The use of bedside swallowing tools can improve patient satisfaction scores, decrease hospital-acquired cases of pneumonia, and produce significant cost savings by minimizing unnecessary referrals to specialty speech therapy services and properly utilizing limited crew members. Hospitals should institute the use of a validated swallow screening tool with a pass/fail solution that allows the bedside nurse to immediately place a patient who is at risk for aspiration in an NPO or nothing by mouth status until he or she can be evaluated with a more thorough test by a swallowing specialist. In some cases, it may be appropriate to re-evaluate with another bedside swallow screen to clear the patient for oral intake at a later time. A good example of this is when patients are sedated, and sedative medications wear off. There are multiple validated tools available, but recent studies do not support any specific swallow screening tool with superior accuracy over other tools [6].

Studies do, however, demonstrate it is essential the bedside nurse be trained to accurately implement these tools and understand that ongoing and routine re-evaluation of swallowing ability will be necessary, particularly in patients with neurodegenerative disorders. Properly trained nurses can help decrease the incidence of healthcare-acquired pneumonia by as much as 57% [5]. The provider should be notified when a patient is unable to pass a bedside swallowing evaluation, but authority to place a patient in NPO status should remain under the guidelines of the protocol. All oral intake including medications should be withheld until further direction is received from the provider [7]. Alternative routes of medication administration should be considered and discussed with the provider for medications that cannot be withheld. The patient and family members should be educated on the risk of aspiration and its implications, and they should be cautioned against consuming anything by mouth [8].

In summary, a properly implemented nurse-driven swallowing protocol using a validated bedside swallowing screening tool has the potential to improve patient safety, decrease healthcare costs, and save lives by significantly reducing the incidence of hospital-acquired aspiration pneumonia.

Availability of Data and Materials

Any and all datasets analysed during the current study are available from the corresponding author upon reasonable request.

Competing Interests

There are no competing interests to discuss or declare.

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Author's Contribution

There is only one author for this manuscript and no other contributors.

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