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Implementing dysphagia assessment in stroke patients: Hospital-based education quality improvement project

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Implementing dysphagia assessment in stroke patients:

Hospital-based education quality improvement project

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Summary

Stroke or the "silent killer" ranks fourth in leading causes of death in Arkansas (Reeve, Balamurugan, Simon, Faulkner, & Zohoori, 2012). In 2010, Arkansas ranked first in the country for stroke mortality (Reeve et al., 2012); this topic is of relevant, and local importance. One of the major complications of a stroke is dysphagia or difficulty in swallowing. Dysphagia is a common manifestation of a stroke, occurring in over 50% of stroke patients (Rofes, Vilardell, & Clavé, 2013). This quality improvement projects' main focus is to evaluate the current practice of dysphagia assessment, compare dysphagia assessment tools, and develop a self-paced education program to train nurses in the use of the chosen dysphagia assessment tool. The goal of this quality improvement project is to decrease the occurrence of adverse effects related to dysphagia, and increase comfort and improve prognosis for the patients.

Implementing dysphagia assessment in stroke patients:

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Background: Dysphagia is a prevalent manifestation of stroke. An evidence-based dysphagia assessment is needed to provide quality care to stroke patients.

Aims: To provide a descriptive analysis of the patient's admitted to the hospital with the primary diagnosis of stroke; to evaluate three dysphagia screening tools; and to develop an education program to address training and implementation of the chosen dysphagia assessment tool on pilot units.

Design: Descriptive analysis, and an educational program.

Setting: Local hospital in Northwest Arkansas.

Patients: Pre-data included patients with the primary diagnosis of stroke, over the age of 18, excluding those identified with cognitive impairment, admitted to the local hospital between August 2013 and August 2014.

Methodology: Phase I was conducted during May to July 2014 and consisted of comparing three dysphagia screening tools; Barnes Jewish Hospital Stroke Dysphagia Screen, the Toronto, and the Gugging Swallow Screen. Next a retroactive medical record review of patients over the age of 18 admitted to the hospital between August 2013 and August 2014, with the primary diagnosis of stroke was conducted. Patients identified with cognitive impairment were excluded from the study. The charts were evaluated to determine: if a dysphagia assessment was administered and how soon following admission to the hospital, the rate of documented pneumonia (information from nurses notes, physician notes, and chest x-ray), medications, occurrence of diagnostic tests, and bed positioning. Phase II

consisted of development and implementation of an education program based on the hospital adopted dysphagia assessment tool.

Analysis: A descriptive analysis and summary statistics were performed to summarize the information obtained through a review of medical records from patients admitted with the primary diagnosis of stroke.

Results: Of the charts analyzed, 94 met the study's inclusion criteria. Of the 94 charts analyzed, 23 charts did not include a dysphagia assessment. Of the 94 charts analyzed, 44 charts revealed administration of PO medications before the documentation of a dysphagia assessment. Of the 44 patients who received PO medications before a dysphagia assessment, 12 charts revealed no documentation of one of the diagnostic tests included in the study, in other words, no documentation of a chest x-ray. Of the 12 charts that revealed no chest x-ray, as well as PO medications before a dysphagia assessment, 4 were declared an aspiration risk. Of the 94 charts analyzed, 2 charts had documented pneumonia at discharge.

Conclusion: The data in this study shows the need for dysphagia assessment and the literature shows the evidence of this need. While the national organizations have not chosen a superior dysphagia screen, the hospital in this study has. The Barnes Jewish Hospital Stroke Dysphagia Screen/ASDS is the dysphagia screen of choice for the hospital in this study, which was implemented in September 2014. The goal of a bedside dysphagia assessment is to detect those suffering from dysphagia with an easy-to-use tool that can be performed by many professions, including nursing. Therefore, nurses must be aware of this need and solution to

care. The organization may implement the assessment, but it is up to the nurses to carry out the implementation. Further assessment should be completed to assess the compliance with the newly implemented dysphagia assessment tool in relation to the education program created and presented to the hospital during this study.

Literature Review

The "silent killer" may approach quietly, but its effects speak loud. A stroke or cerebral vascular accident (CVA) is defined as a brain attack (Signorino, 2014). There are two types of stroke; an ischemic stroke, which results from insufficient blood flow to the brain and accounts for 87% of all strokes; and a hemorrhagic stroke, which results from a ruptured vessel that leaks blood into the brain and accounts for 13% of all strokes (Signorino, 2014). Approximately every forty seconds, someone in our country suffers a stroke (*Safeguarding your brain*, 2011). With this already astounding rate of occurrence, the incidence of a stroke may increase due to the rising number of older adults in our society (Guyomard et al., 2009). The United States annual stroke occurrence is approximately 500,000 with a mortality rate as high as 30% within the first year (Guyomard et al., 2009). The focus hospital for this study resides in Arkansas; therefore for the purpose of this study, Arkansas has been zoomed in on to illuminate the relevance of this medical issue in relation to the geographic area. Stroke is the fourth leading cause of death in Arkansas and the nation (Reeve et al., 2012). According to the Arkansas Department of Health, Arkansas ranked first in the country for stroke mortality in 2010 (Reeve et al., 2012). Arkansas is part of the stroke belt, a southeast portion of the United States known for its high stroke rates (Reeve et al., 2012). In 2011, there

were 1,557/100,000 people who died from a stroke in Arkansas (Reeve et al., 2012). The impact of stroke mortality is high but the complications associated with strokes can also be a burden to the family, as well as the health care institution. This quality improvement project focuses on the potential complication of oropharyngeal dysphagia (OD) in relation to stroke.

OD is defined as having difficulty in the process of swallowing; this definition includes the swallowing of any liquid, including saliva, or solid mater (Cook & Kahrilas, 1999; Guyomard et al., 2009). The act of swallowing seems mindless, we swallow hundreds of times a day, but in reality the complex process of swallowing results in the activation of 26 muscle groups and over 30 nerves within a short time period (Matsuo & Palmer, 2008; Buettner, Beer, Hannig, & Settles, 2001). In order to fully understand dysphagia, it is important to understand the fundamentals of swallowing (Matsuo & Palmer, 2008). The act of swallowing is made of three distinct phases: 1) the preparation (oral) phase, under voluntary control the food is put into the mouth and chewed, 2) the pharyngeal phase, beginning with the triggering of the swallow reflex, this phase lasts 0.7 seconds and concludes with the closing of the upper esophageal sphincter, and 3) the esophageal phase, where the matter is moved toward the stomach by peristalsis (Buettner et al., 2001). The oral phase can be further broken down to two stages (Matsuo & Palmer, 2008). The first of these stages is the oral-preparatory stage; during this stage liquid enters the mouth and goes to the anterior floor or lands on the tongue, then is pressed to the roof of the mouth (hard palate) (Matsuo & Palmer, 2008). At the back of the mouth there is a seal between the soft palate and the tongue, which keeps liquid from

leaking into the oropharynx until it is time to swallow (Matsuo & Palmer, 2008). During the eating of solids there is no seal at the posterior portion of the tongue and soft palate; rather, the tongue and the soft palate move in rhythm with jaw movement during chewing (Matsuo & Palmer, 2008). The lack of seal during eating allows for air to travel through the pharynx and into the nasal cavity, revealing the aroma from the food to the chemoreceptors in the nose (Matsuo & Palmer, 2008). The second stage of the oral phase is the oral-propulsive stage: during this stage the tip of the tongue elevates and lands just behind the upper teeth; meanwhile, the back of the tongue drops, and the rest of the tongue expands and presses upward, squeezing the liquid back into the pharynx (Matsuo & Palmer, 2008). If drinking liquids, the pharyngeal stage begins during the oral propulsion stage (Matsuo & Palmer, 2008). The next phase is the pharyngeal phase, consisting of two main features: passage of food, and protection of the airway (Matsuo & Palmer, 2008). The solid or liquid bolus is pushed through the pharynx and upper esophageal sphincter (UES) to the esophagus (Matsuo & Palmer, 2008). During this phase, the soft palate rises and creates contact with the sides and posterior walls of the pharynx, this closes the entrance to the nasal cavity when the bolus reaches the pharynx (Matsuo & Palmer, 2008). The tongue moves backwards pressing the bolus to the pharyngeal wall, the pharyngeal muscles constrict, contract, and shorten as they move the bolus down (Matsuo & Palmer, 2008). At this time there are many airway protection functions taking place (Matsuo & Palmer, 2008). The vocal folds close to seal the space between them, the glottis; the larynx is moved forward and up, which places it below the base of the tongue; and the epiglottis tilts backward,

which seals the laryngeal vestibule, the cavity of the larynx just above the vocal folds (Matsuo & Palmer, 2008). Once the airway protection mechanisms have taken place, the UES opens and allows the bolus to enter the esophagus, which then leads to the esophageal phase (Matsuo & Palmer, 2008). Once the bolus passes through the UES, the soft palate lowers, the larynx and pharynx open, and the UES closes (Matsuo & Palmer, 2008). During swallowing, the esophagus relaxes and peristalsis takes place allowing the bolus to travel to the stomach (Matsuo & Palmer, 2008). Peristalsis has two phases, relaxation which flows with the bolus, and then contraction that propels the bolus (Matsuo & Palmer, 2008). The bolus then travels through the lower esophageal sphincter (LES), and into the stomach (Matsuo & Palmer, 2008).

Strokes that can impair the science of swallow include: cerebral, cerebellar, and/or brain stem lesions (Martino et al., 2005). Cerebral lesions disturb the voluntary control of chewing and bolus transport during the first phase of swallowing, the oral phase (Martino et al., 2005). Cortical lesions that involve the precentral gyrus are capable of causing impairments in motor control on the side of the body opposite of where the stroke occurred in the brain, impacting the face, lips, and tongue (Martino et al., 2005). Cortical lesions are also capable of causing impairments in the esophagus effecting peristalsis, which is the mechanism of transport for the bolus during the esophageal phase (Martino et al., 2005). Cerebral lesions affect cognitive function; the ability to concentrate on the task of eating may affect swallowing ability (Martino et al., 2005). Strokes that occur in the brain stem do not occur as often as cortical lesions, but when they do occur they cause the

greatest swallowing dysfunction (Martino et al., 2005). Brain stem strokes may result in altered sensation of the mouth, tongue, and cheek; disturb the triggering of swallow during the pharyngeal phase; and disrupt laryngeal elevation, closing of the glottis, and cricopharyngeal relaxation (Martino et al., 2005). Independent of lesion location, there are age related changes in the process of swallowing (Martino et al., 2005). An age-related change in swallow is the decrease in efficiency of the seal between the posterior tongue and soft palate, which allows the liquid to seep into the pharynx before it is time to swallow (Matsuo & Palmer, 2008). Stroke is more common in the elderly; therefore their dysphagia may be a consequence both of the location of the lesion and age-related changes in swallow (Martino et al., 2005).

The processes of eating, swallowing, and breathing must operate simultaneously, yet be tightly coordinated (Matsuo & Palmer, 2008). 50% of those who suffer from an acute stroke will also suffer from an "unsafe swallow" (Daniels et al., 2009). Coordination of the three swallowing phases is crucial to prevent aspiration (Buettner et al., 2001). When we swallow, we stop breathing due to the mechanisms discussed earlier: elevation of the soft palate to seal the nasal cavity, movement of the larynx under the tongue, and tilting of the epiglottis; in addition, there is also a neural component in the brainstem that suppresses the act of respirations (Matsuo & Palmer, 2008). When ingesting a liquid, the swallowing process begins during the expiration of a breath, pausing the respirations for 0.5-1.5 seconds, then respirations resuming during expiration (Matsuo & Palmer, 2008). When ingesting a solid the pattern of respirations is the same as when ingesting a liquid, "exhale-swallow-exhale" (Matsuo & Palmer, 2008). But the length of the

respiratory pause differs, the pause is longer and begins earlier; also, during chewing our respirations occur slower, then increase during swallowing (Matsuo & Palmer, 2008). If the process of eating, swallowing, and breathing are out of sync, one of the main features of the pharyngeal phase of swallowing, airway protection is compromised (Matsuo & Palmer, 2008). Two mechanisms may take place when airway protection is compromised: laryngeal penetration, and/or aspiration (Matsuo & Palmer, 2008). Laryngeal penetration takes place when the bolus is moved down from the mouth, or up from the esophagus and into the larynx above the vocal folds (Matsuo & Palmer, 2008). Aspiration takes place when the bolus travels through the vocal folds (Matsuo & Palmer, 2008). Aspiration occurs when matter enters the airway just below the vocal cords, which can be due to unsafe swallow (Ramsey, Smithard, & Kalra, 2003). Aspiration can take place before, during, or after a swallow, posing a risk of aspiration pneumonia or airway obstruction (Matsuo & Palmer, 2008). The normal, natural response to aspiration is coughing, but those who have lost sensation may be unable to elicit that response (Matsuo & Palmer, 2008).

Some patients experience silent aspiration in which there are no objective signs of distress (Ramsey et al., 2003). In 1983, Linden and Siebens were the researchers who created the term “silent penetration”, they looked at patients with dysphagia using videofluoroscopy and observed them for laryngeal penetration; they were interested in those who had laryngeal penetration without the outward signs of aspiration, such as a cough (Ramsey, Smithard, & Kalra, 2005). Coughing is an outward sign of distress that is assessed for during dysphagia assessments.

There are two unique types of involuntary, reflexive cough (Ramsey et al., 2005). The laryngeal cough reflex occurs at the vocal folds; while the tracheobronchial cough reflex is deeper, more delayed, and doesn't produce as much sputum (Ramsey et al., 2005). It is possible that these cough reflexes can be affected by a stroke event, therefore just because a cough is absent, it may not indicate the absence of aspiration (Ramsey et al., 2005). Silent aspiration occurs when there is a weakness or lack of coordination within the pharyngeal muscles, resulting in irregular triggering of a swallow; affecting a range of 2-25% of patients who suffer from an acute stroke, and 25-30% of patients who are referred for a dysphagia evaluation (Matsuo & Palmer, 2008; Ramsey et al., 2005). Silent aspiration occurs when signs of aspiration are noted during a videofluoroscopy (VF) but result in no obvious, outward signs of distress (Ramsey et al., 2005). Another technique that can be used to detect silent aspiration is fiberoptic endoscopic evaluation of swallowing (FEES); this technique is just as sensitive as VF (Ramsey et al., 2005). VF and FEES are the best-known methods for detecting silent aspiration (Ramsey et al., 2005). The purpose of a bedside swallow assessment is to note any outward signs of distress, which are indicative of dysphagia or aspiration; since silent aspiration shows no outward signs; further testing is needed (VF or FEES) (Ramsey et al., 2005). A noninvasive technique used in testing for silent aspiration is pulse oximetry during swallowing (Ramsey et al., 2005). During swallowing, a desaturation of greater than 2% from baseline may indicate aspiration (Ramsey et al., 2005). Although the manufacturer's error rate for some pulse oximetry equipment is 2%, it still allows

for another facet of information during dysphagia assessments (Ramsey et al., 2005).

OD occurs in over 50% of stroke patients, and can lead to dehydration, malnutrition, and place the stroke patient at risk of aspiration leading to pneumonia (Rofes et al., 2013). Approximately half of the patients who suffer from dysphagia will suffer from aspiration (Hinchey et al., 2005). One third of the patients with dysphagia will develop pneumonia, which is responsible for 35% of the deaths occurring post-acute stroke (Hinchey et al., 2005). Post-stroke pneumonia results due to the aspiration of secretions or matter in relation to dysphagia (Hinchey et al., 2005). Dysphagia can impair a stroke victim's quality of life, as well as impede their recovery and prognosis (Terré & Mearin, 2006). More specifically, the complications that accommodate dysphagia in stroke patients include: up to six times greater mortality, up to three times greater comorbidity, up to three times greater risk of aspiration pneumonia, and up to 1.5 times poor long term outcomes (Guyomard et al., 2009). Although there are many complications related to stroke and dysphagia, timely care and efficient interventions have the potential to better the outcomes for those affected (Guyomard et al., 2009). The known risk of pneumonia due to dysphagia represents a preventable complication of a stroke (Hinchey et al., 2005). The Agency for Healthcare Research and Quality recognizes the need for dysphagia assessment and management for stroke patients (Hinchey et al., 2005). According to the European Society for Swallowing Disorders (ESSD), all acute stoke patients should be kept NPO (nothing by mouth) until their swallow reflex has been assessed by trained professionals using an approved screening tool

(Rofes et al., 2013). The swallow assessment of acute stroke patients should be performed as soon as the patient is alert and awake; more specifically, the United Kingdom's National Institute for Clinical Excellence encourages a swallow screen for stroke patients within 4 hours of admission (Rofes et al., 2013; Neila et al., 2013). Should the assessment reveal difficulty in swallowing, the patient should then be assessed with a formalized assessment for dysphagia (Rofes et al., 2013).

Screening for swallowing difficulty is a valuable part of the assessment for an acute stroke patient (Hutchinson & Wilson, 2013). The process of testing for dysphagia can be looked at in three phases (Martino et al., 2005). The first phase is the initial screening performed on a stroke patient who is newly admitted, the purpose is to detect the likelihood of dysphagia (Martino et al., 2005). If dysphagia is suspected a more extensive screening is performed by a more trained clinician at the bedside (Martino et al., 2005). This level of screening relates to the dysphagia assessment tools looked at in this project. These tests consist of assessing cranial nerves (facial asymmetry, tongue asymmetry) and the swallowing of different textured liquids or solids (Martino et al., 2005). If dysphagia is still suspected, testing with instrumentation is indicated (Martino et al., 2005). The gold standard for assessing swallow is the videofluoroscopic (VF) assessment; this is the only technique where the entire swallow can be visualized, from the lips to the esophagus (Martino et al., 2005). Screening is performed by trained medical, nursing or other health professionals, who then determine if oral intake is appropriate (Hutchinson & Wilson, 2013). While the VF (modified barium swallow) is the gold standard, the most used technique of dysphagia assessment is the

bedside swallow assessment (Ramsey et al., 2003). The usual dysphagia screening consists of assessing the patient's level of consciousness, posture, oral function, gag reflex, voice characteristics, speech function, voluntary cough, movement of throat while swallowing, and assessing eating and drinking (Nishiwaki et al., 2005). As the patient drinks small amounts of water, the trained staff closely monitors for signs of abnormal swallowing (i.e., leakage of fluid from mouth, pooling of fluids) or signs of aspiration (i.e., coughing, watering eyes, shortness of breath, or vocal changes) (Hutchinson & Wilson, 2013). Abnormal results of the assessment are predictive of dysphagia (Nishiwaki et al., 2005). Facilities that have incorporated a formal swallow assessment have experienced lower rates of aspiration pneumonia than sites with no screening method (Martino et al., 2009). The risk of pneumonia decreases by three-fold with the use of a formal dysphagia screen, one that includes a check-list and water swallow test, as in the Barnes Jewish Hospital Stroke Dysphagia Screen/ASDS (Hinchey et al., 2005). The use of a formal dysphagia screen promotes adherence and efficiency in administering the screen prior to oral intake (Hinchey et al., 2005). There are many options when looking at formal dysphagia screens, while the use of a dysphagia assessment is recommended there is not one tool that is recommended more than the others.

The Toronto or TOR-BSST, a well-known swallow screen, contains five items that have high predictive value for dysphagia (Martino et al., 2009). The goal of the TOR-BSST is to identify dysphagia in stroke survivors, through a simple yet predictive tool that trained personnel can perform without being an expert (Martino et al., 2009). The Toronto swallow screen is performed by nurses; it takes ten

minutes to administer, and four hours to train the staff (Schepp, Tirschwell, Miller, & Longstreth, 2012). When a stroke patient tests negative with the TOR-BSST, there is a high degree of confidence that they will not suffer from dysphagia (Martino et al., 2009).

The Barnes Jewish Hospital Stroke Dysphagia Screen (also known as the Acute Stroke Dysphagia Screen or ASDS) is a simple bedside screening tool providing sensitive detection of dysphagia in stroke patients (Edmiaston, Connor, Steger-May, & Ford, 2014). This screening tool is performed by nurses; it takes two minutes to administer, and ten minutes to train the staff (Schepp et al., 2012). This screening tool consists of four questions, which determine if the patient goes on to the phase of swallowing three ounces of water (Schepp et al., 2012).

Many swallow screens begin by having the patient swallow a liquid (Trapl et al., 2007). However, swallowing liquids poses problems for stroke patients, with the possibility of the liquid penetrating into the larynx while swallowing (Trapl et al., 2007). Therefore, initial testing of a stroke patient's swallow reflex with water may cause aspiration. The Gugging Swallow Screen (GUSS) is a bedside assessment aimed at decreasing the risk of aspiration during the swallow test to a minimum (Trapl et al., 2007). The assessment, performed by a stroke nurse or therapist, is designed as a graded rating, assessing both fluid and non-fluid nutrition, starting with non-fluid textures (Trapl et al., 2007). The GUSS is a cost-effective assessment tool, which assesses the pathophysiology of swallowing with less discomfort for the patient (Trapl et al., 2007). GUSS not only measures the severity of dysphagia, but provides information for dietary recommendations (Trapl et al., 2007).

This quality improvement project was conducted at a hospital in Northwest Arkansas who has made a commitment to provide the highest level of care to stroke patients by becoming a Primary Stroke Center recognized by The Joint Commission (TJC). As part of the assessment desires of the organization, the need for an evidence-based dysphagia-screening tool was identified. Recently the hospital has adopted a dysphagia-screening tool called the Barnes Jewish Hospital Stroke Dysphagia Screen (also known as the Acute Stroke Dysphagia Screen (ASDS)).

The aims of the study were: 1) to provide a descriptive analysis of the patient's admitted to the hospital with the primary diagnosis of stroke, describing if a dysphagia assessment was conducted and the time from admission to dysphagia assessment, the rate of documented pneumonia (information from nurses notes, physician notes, and chest x-ray), medications, the occurrence of diagnostic tests, and bed positioning; 2) to evaluate three dysphagia screening tools; and 3) develop an education program for nurses, to address training and implementation of the chosen dysphagia assessment tool on pilot units.

Methodology

The University of Arkansas Institutional Review Board and the hospital's Quality Improvement Department approved this quality improvement project. The quality improvement project consisted of two phases. Phase I was conducted during May to July 2014, and consisted of comparing three dysphagia screens: The Barnes Jewish Hospital Stroke Dysphagia Screen, the Toronto, and the Gugging Swallow Screen. Next a retroactive medical record review of patients over the age of 18 admitted to the hospital between August 2013 and August 2014, with the

primary diagnosis of stroke was conducted. Patients identified with cognitive impairment were excluded from the study. Each chart was assigned a random number. In accordance with the guidelines of the Health Insurance Portability and Accountability Act (HIPAA) all inpatient information was deidentified, and the review was conducted in a secure authorized environment. The purpose of Phase I was to gain knowledge of dysphagia assessment tools and to evaluate hospital practice prior to implementation of an education program on dysphagia assessment. Phase II consisted of development and implementation of an education program based on the hospital adopted dysphagia assessment tool.

An education program was developed and presented to the nursing units in book form. The books were presented to the hospital in September 2014, along with sign-in sheets with a comments section. The sign-in sheets were left at the hospital for one month, and picked up in October 2014. The books stayed at the hospital upon request. The objectives of the education program were to: 1) describe dysphagia and its association in stroke patients; 2) inform the staff about complications associated with dysphagia; 3) introduce the staff to the adopted dysphagia assessment tool; 4) educate on when and how the tool should be administered to stroke patients; and 5) explain appropriate documentation in the medical record. The education books were presented to the hospital nursing staff of units designated as pilot units by nursing administration, which included the critical care units and a neuro-progressive unit.

ANALYSIS

A descriptive analysis and summary statistics were performed to summarize the information obtained through a review of medical records from patients admitted with the primary diagnosis of stroke. The statistics program utilized was SPSS20.

RESULTS

Between August 2013, and August 2014, 94 charts met the study criteria. Inclusion criteria included: primary diagnosis of stroke, over the age of 18, excluding those identified with cognitive impairment, and admission between August 2013 and August 2014. Of the 94 cases included, the mean age of patients was 68.60. The most common diagnosis was cerebral artery occlusion, with cerebral infarction, occurring in 60 patients (Table 1).

Table 1

Occurrence of Different Primary Diagnosis in Stroke Patients

Primary diagnosis	Frequency	Percent (%)	Cumulative Percent (%)
Cerebral artery occlusion, with cerebral infarction	**60**	**63.8**	**63.8**
Cerebral infarction	2	2.1	66.0
Cerebral vascular accident (CVA)	**1**	**1.1**	**67.0**
Cerebral embolism, with cerebral infarction	14	14.9	81.9
Transient ischemic attack; cerebral artery occlusion, with cerebral infarction	**1**	**1.1**	**83.0**
Occlusion and stenosis of carotid artery, with cerebral infarction	5	5.3	88.3

Intracerebral hemorrhage	**9**	**9.6**	**97.9**
Cerebral thrombosis, with cerebral infarction	2	2.1	100.0
Total	94	100.0	

Dysphagia Assessment

Of the 94 patients who suffered from a stroke, 23 (24%) did not receive a dysphagia assessment. Of the 94 cases, 71 (75.5%) did receive a dysphagia assessment (Table 2).

Table 2

Occurrence of a Dysphagia Assessment

Dysphagia Assessment provided to stroke patient	Frequency	Percent (%)
Yes	71	75.5
No	23	24.5
Total	94	100.0

A variety of different professions administered the dysphagia screen, including speech pathology, nursing, or a physician. Figure 1 not only reveals who performed the dysphagia assessment, but who performed the *first* dysphagia assessment. Of the 71 cases, which received a dysphagia assessment, 18 (19.1%) were administered by a nurse, 52 (55.3%) were administered by a speech pathologist, and one (1.1%) was administered by a physician (Figure 1). Some of the patients received two dysphagia assessments during their stay. Of the 94 total cases, 77 (81.9%) cases did not receive a second dysphagia assessment (Figure 2). Two

(2.1%) of the second dysphagia assessments were administered by nursing, and the remaining 15 (16%) were administered by speech pathology (Figure 2).

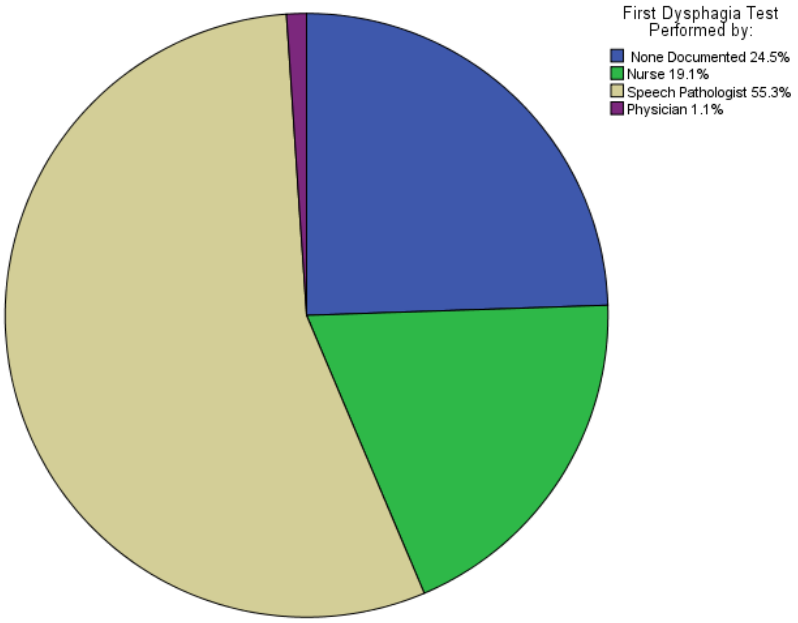

Figure 1.

Administrators of the First Dysphagia Assessment. This figure illustrates the different professions who administered dysphagia assessments: speech pathology, nursing, and a physician.

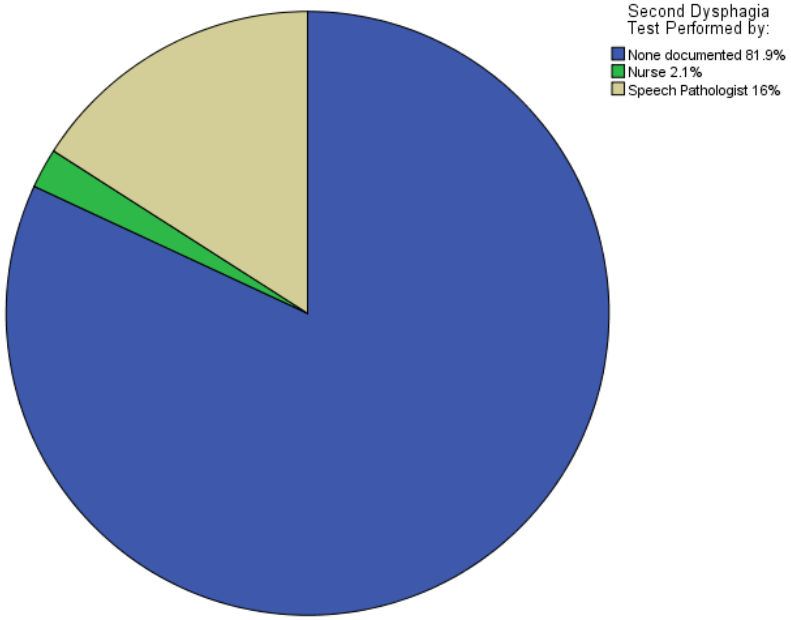

Figure 2. Administrators of a Second Dysphagia Assessment. This figure illustrates how some patients received a second dysphagia screen performed by speech pathology or nursing.

Another factor assessed was the number of hours after admission to the time of the first dysphagia assessment. The mean number of hours after admission to assessment was 16.59. The shortest time from admission to documentation of a dysphagia assessment was 1 hour, while the longest length of time was 314 hours (Figure 3). Figure 3 shows negative numbers due to the dysphagia assessment being administered before the patient's admission time. The farthest negative number documented was -96, meaning the dysphagia assessment was administered 96 hours prior to the admission time (Figure 3). The farthest positive number was 314, meaning the dysphagia assessment was administered 314 hours after the admission time (Figure 3).

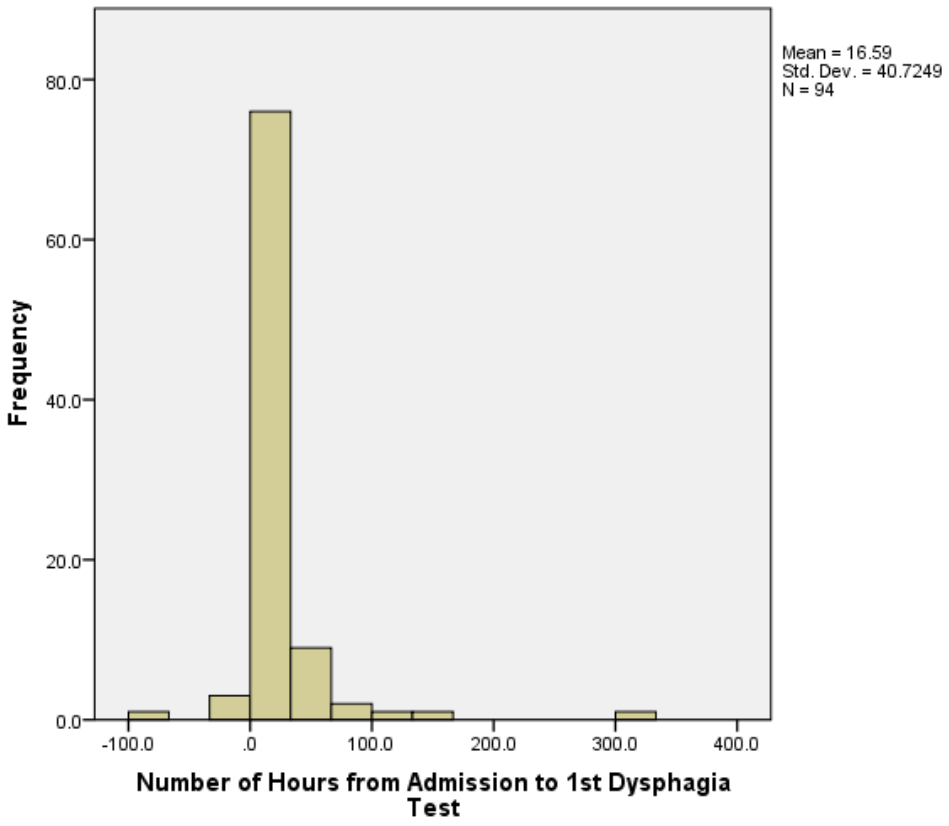

Figure 3. Time (in hours) from Admission to Dysphagia Assessment. This figure illustrates the variety and commonalities in length of time until documentation of administration of a dysphagia assessment in relation to admission.

Aspiration Risk

Of the 71 cases that received the initial dysphagia assessment, 27 (28.7%) were deemed to be at risk for aspiration or placed on NPO status after the dysphagia assessment was performed (Figure 4). Of the 71 cases that received a dysphagia assessment, 44 (46.8%) were labeled as not an aspiration risk after the dysphagia assessment was performed (Figure 4).

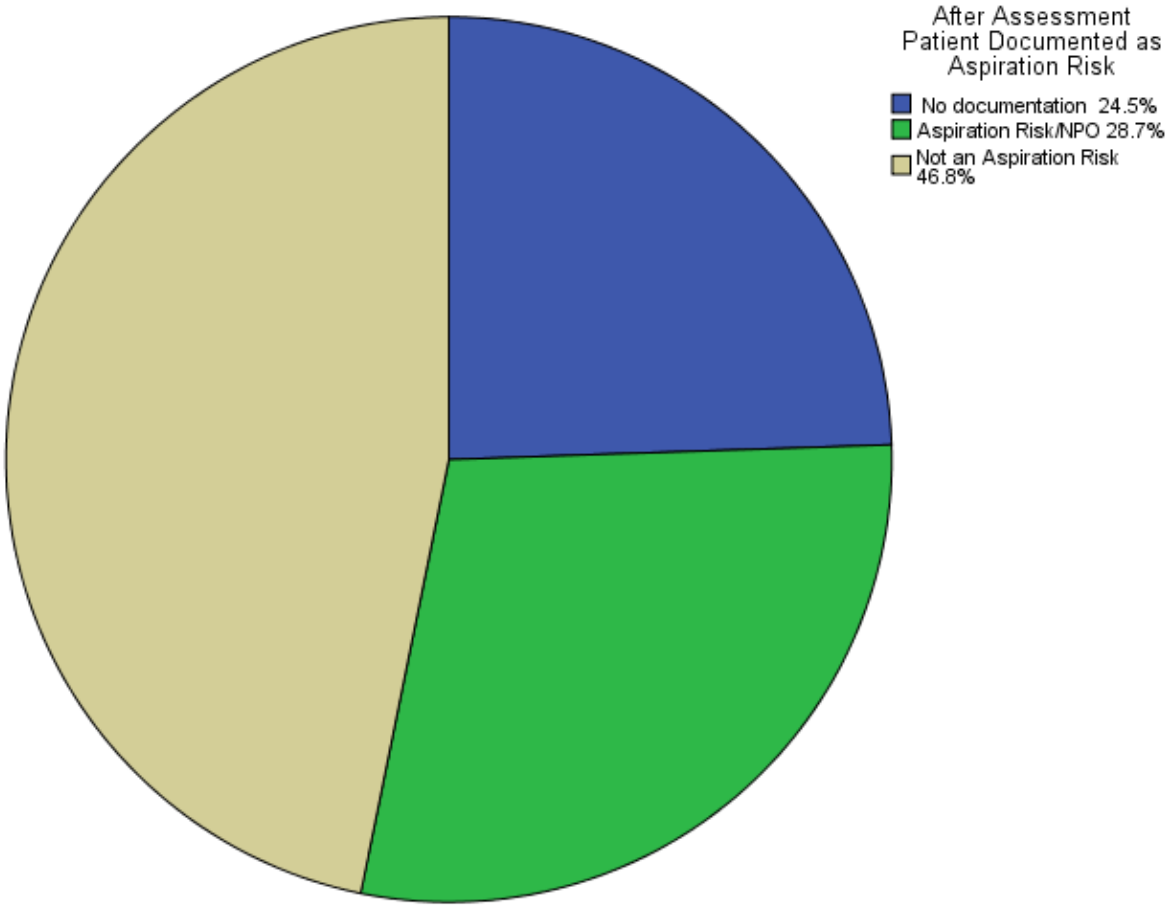

Figure 4. After Assessment Patient Documented as an Aspiration Risk. This figure illustrates the occurrence of those deemed an aspiration risk or placed on NPO status after receiving a dysphagia screen.

Complications

Aspiration with resultant pneumonia is a common complication with disorders of swallowing. The patient medical records were analyzed for documentation of pneumonia at discharge. At the time of discharge, of the 94 charts analyzed, 2 (2.1%) were documented to have developed pneumonia (Table 3).

Table 3

Documentation of Pneumonia at Discharge

Pneumonia at discharge	Frequency	Percent (%)
Yes	2	2.1
No	92	97.9
Total	94	100.0

The types of diagnostic tests administered were also assessed. The various diagnostic tests noted in this study included: chest x-ray, swallow study, x-ray of esophagus with speech, and esophagogastroduodenoscopy. Some patients received more than one diagnostic test, while others had no documentation of any diagnostic tests included in this study. Of the 94 cases analyzed for a first diagnostic test, 33 (35.1%) had no documentation, 57 (60.6%) patients received a chest x-ray, 3 (3.2%) received a swallow study, and 1 (1.1%) received an esophagogastroduodenoscopy. Of the 94 cases analyzed for a second diagnostic test, 90 (95.7%) had no documentation. 2 (2.1%) received a chest x-ray, 1 (1.1%) received a swallow study, and 1 (1.1%) received an x-ray of the esophagus with speech.

PO Medication (medication by mouth) Before Dysphagia Assessment

Of the 71 who received a dysphagia assessment, 44 (46.8%) patients received PO medication before the administration of a dysphagia assessment (Figure 5). The

remaining 27 (28.7%) patients did not receive any PO medication before they received a dysphagia assessment (Figure 5).

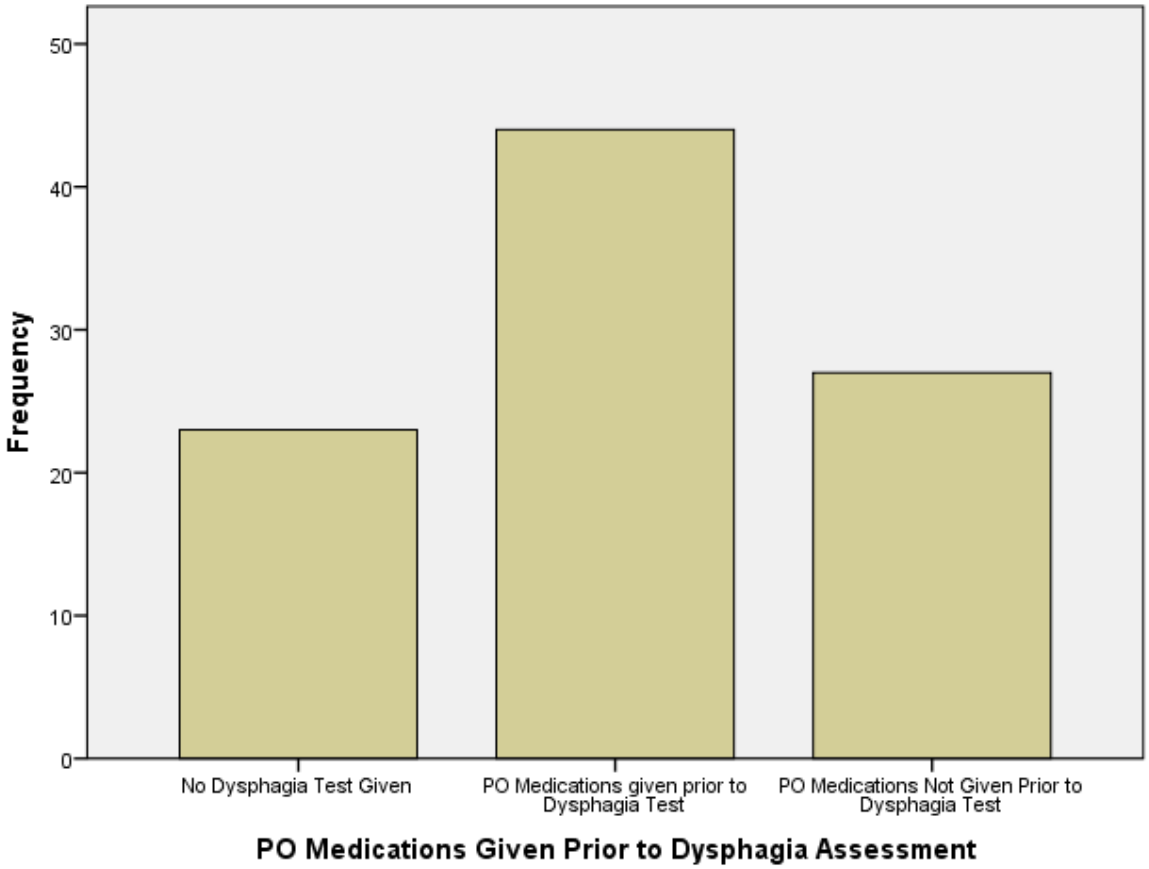

Figure 5. PO Medications Given Prior to Dysphagia Assessment. This chart illustrates the occurrence of administration of PO medications before a dysphagia assessment was administered.

The most frequent amount of PO medications given before a dysphagia assessment was 1 PO medication, occurring in 9 patients (Figure 6). 7 patients received 4 PO medications before a dysphagia assessment, and 6 patients received 2 PO medications (Figure 6). The highest number of PO medications given before a dysphagia assessment was administered was 36 medications (Figure 6).

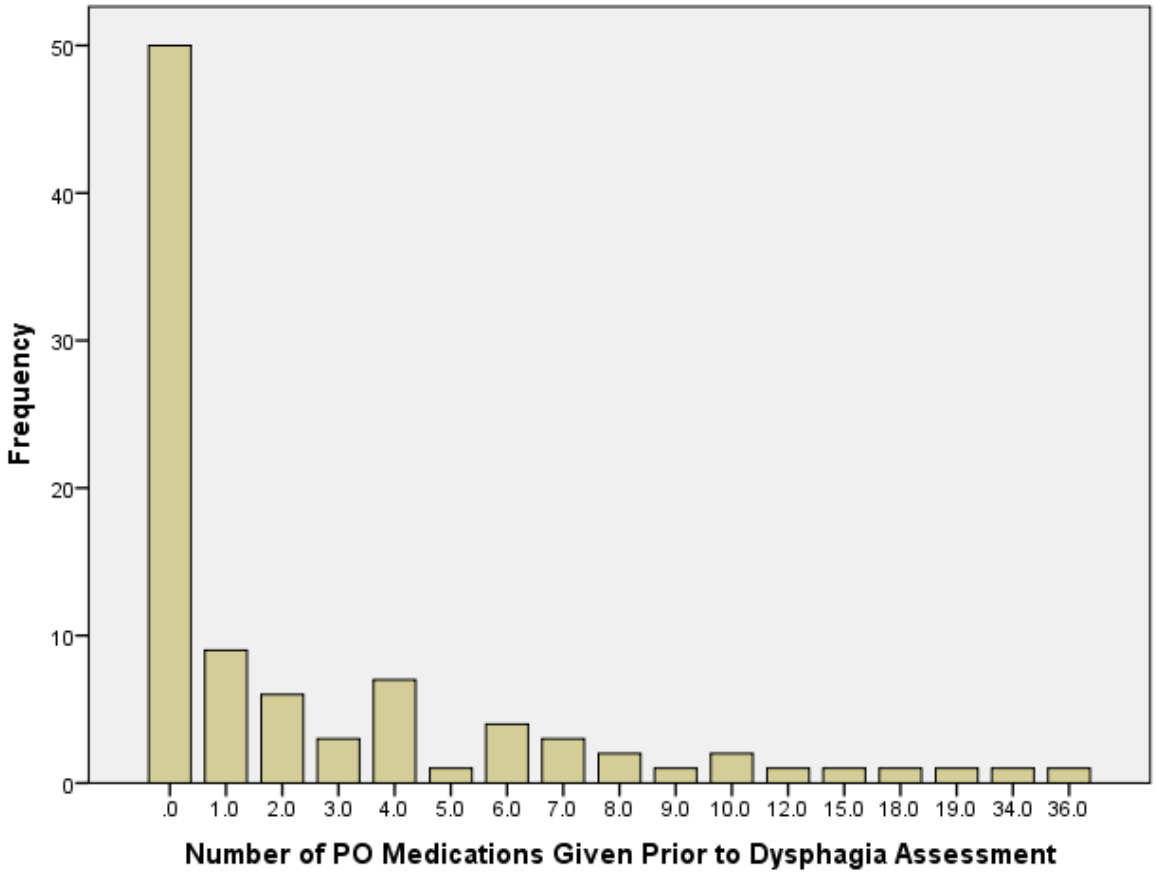

Figure 6. The Number of PO Medications Given Prior to Dysphagia Assessment. This figure illustrates the frequency of various amounts of PO medications administered before a dysphagia assessment.

HOB

Of the 94 charts analyzed and the 71 cases that received a dysphagia assessment, 50 (53.2%) patients had no documentation of head of bed (HOB) elevation. 3 (3.2%) patients had documentation of the HOB being elevated to 30 degrees or above prior to the dysphagia assessment, 6 (6.4%) patients had documentation of the HOB being elevated to 30 degrees or above after the dysphagia assessment, and 12 (12.8%) patients had documentation of 30 degrees or above before and after the dysphagia assessment.

DISCUSSION

The need for improving performance, consistency, and efficiency of dysphagia assessments is evident. The word is gradually spreading about the importance of dysphagia assessments. Unfortunately, a sense of clear direction is lacking. As of 2009, TJC Primary Stroke Center certification labeled dysphagia assessment as a performance measure (Lakshminarayan et al., 2010). The National Quality Forum then did not endorse the measure, due to lack of clear, defined standards that reveal the constitution of a valid dysphagia screen and/or the discovery of a single screen to be superior (Lakshminarayan et al., 2010). Therefore, in 2010, TJC repealed it from the performance measures list (Lakshminarayan et al., 2010). The lack of support from elite organizations may hinder the occurrence of dysphagia assessments and worsen the occurrence of post-stroke complications related to dysphagia (Lakshminarayan et al., 2010). Currently TJCs specifications manual for national hospital inpatient quality measures has eight core measures for stroke care; this manual is in effect from 1/1/2015 to 09/30/15 (The Joint Commission, 2015). The eight core performance measures include: venous thromboembolism prophylaxis, discharged on antithrombotic therapy, anticoagulation therapy for atrial fibrillation/flutter, thrombolytic therapy, antithrombotic therapy by end of hospital day two, discharged on statin medication, stroke education, and assessed for rehabilitation (The Joint Commission, 2015). Dysphagia assessment is not included in the current "Stroke National Hospital Inpatient Quality Measures" created by TJC (The Joint Commission, 2015).

Despite the confusion on if dysphagia assessment should be included as a performance measure by TJC Primary Stroke Center, dysphagia assessments do improve the outcomes of patients suffering from a stroke. The risk of pneumonia decreases by 3-fold with the use of a formal dysphagia screen, one that includes a check list and water swallow test, as in the Barnes Jewish Hospital Stroke Dysphagia Screen/ASDS (Hinchey et al., 2005). The use of formal screening improves performance of dysphagia assessment before the initiation of oral intake (Hinchey et al., 2005). The adoption of a formal dysphagia screen also should include the adoption of a unified assessment approach. The literature suggests that the dysphagia screen be administered to all patients who suffered a stroke, regardless of the stroke severity or assumed risk of pneumonia (Hinchey et al., 2005).

The data collected in this study revealed that between August 2013 and August 2014, 24.5% of patients who suffered from a stroke did not receive a dysphagia assessment. The reasoning behind this is unknown, many factors could have taken place; but this is where the use of a formalized dysphagia assessment with a unified approach could improve the outcomes for stroke patients. Out of the 71 patients who received a dysphagia screen, 44 also received PO medications before the administration of the dysphagia screen. Some of the PO medications even had instructions to mix with 8 ounces of water. As the length of time between admission to dysphagia assessment increases, the more time there is to make a mistake and administer oral intake. For example, in one case, the time between admission and dysphagia assessment was 125 hours, and the patient received 36 PO medications before the dysphagia assessment. With the occurrence of 46.8% of patients

receiving PO medications before the administration of dysphagia assessment, the rate of documented pneumonia at discharge was 2.1%. While the occurrence of documented pneumonia is low, many patients did not receive diagnostic tests, or more specifically did not receive a chest x-ray. Of the 94 cases included in the study, 33 cases did not have documentation of one of the diagnostic tests included in the study. Of the 94 cases included in the study, 57 cases received a chest x-ray. Of the 2 patients with documented pneumonia at discharge, they both received PO medications before a dysphagia assessment, and both received a chest x-ray. Of the 44 patients who received PO medications before a dysphagia assessment, 12 patients did not receive one of the diagnostic tests included in this study, more specifically; they did not receive a chest x-ray. Of the 12 patients who received PO medications before a dysphagia assessment, and did not receive diagnostic tests, after the dysphagia assessment was administered 4 patients were deemed to be an aspiration risk or placed on NPO status. These findings reveal the possibility of undetected aspiration pneumonia. If patients were given PO medications before a dysphagia assessment, and post-assessment found to be an aspiration risk, there should have been further assessment. If they did not receive a chest x-ray, there could have been a possibility of undiagnosed aspiration pneumonia.

Limitations/Recommendations

A limitation of this study would be small sample size. It would have been interesting to stretch even farther back in the charts to enable a larger sample size. Another limitation of the study was the lack of post data. It would be interesting to see if the education book had any effect on the usage of the adopted dysphagia

assessment tool and documentation. Another limitation of this study was the organization of the documentation of the dysphagia assessment. During the time period of August 2013 and August 2014, the documentation of a dysphagia assessment could be found in four different locations: results review, documents (nurses notes), iView, or as a stroke care plan. This was a challenge during the data retrieval process. A recommendation for the future is to assess the post data for this study; assess for the implementation of the Barnes Jewish Hospital screen/ASDS, the occurrence of unified dysphagia assessments, the occurrence of nurses performing the dysphagia assessment, and correct documentation.

Conclusion/Clinical Relevance

The data in this study shows the need for dysphagia assessment and the literature shows the evidence behind the need. The need for a formalized dysphagia assessment and a unified approach to the assessment process is evident. The solutions, and further research to meet this need are crucial for the patients suffering from a stroke, and crucial to gain the support from elite organizations such as TJC. TJC removed dysphagia assessment from the performance measures list for stroke patients based on the lack of endorsement from The National Quality Forum (Lakshminarayan et al., 2010). The National Quality Forum did not endorse dysphagia assessment as a performance measure due to the lack of clear defined standards that reveal a valid dysphagia screen and/or the discovery of a single screen to be better than the rest (Lakshminarayan et al., 2010). While these organizations don't endorse dysphagia assessment as a performance measure, many organizations realize the importance. The guidelines created by the following three

organizations are in support of dysphagia assessment: the American Heart Association/American Stroke Association, encourages assessment before oral intake, including PO aspirin; the Veteran's Health Administration declares that all who suffer from a stroke or are experiencing stroke symptoms should have their swallow screened before oral intake; the United Kingdom's National Institute for Clinical Excellence encourages a swallow screen for stroke patients within 4 hours of admission (Neila et al, 2013). While the national organizations have not chosen a superior dysphagia screen, the hospital in this study has. The Barnes Jewish Hospital Stroke Dysphagia Screen/ASDS is the dysphagia screen of choice for the hospital in this study, which was implemented in September 2014. The implementation of a formalized dysphagia assessment is crucial at the organizational level as well as the staffing level. The goal of a bedside dysphagia assessment is to detect those suffering from dysphagia with an easy-to-use tool that can be performed by many professions, including nursing. Therefore, nurses must be aware of this need and solution to care. The organization may implement the assessment, but it is up to the nurses to carry out the implementation. Further assessment should be completed to assess the compliance with the newly implemented dysphagia assessment tool in relation to the education program created and presented to the hospital during this study. With the implementation of a formalized bedside swallow screen, hopefully, a uniform approach to the dysphagia screening process will follow, and no stroke patients will fall through the cracks of assessment.

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