

Aspiration prevention: A matter of life and breath

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SWALLOWING IS A complex activity that requires muscular coordination and timing for airway protection. The deglutition (swallowing) process propels a bolus from the mouth, through the esophagus, and into the stomach. Although it begins as a voluntary activity, the swallowing reflex becomes involuntary when food or fluid reaches the pharynx.

Pulmonary aspiration is the misdirection of oral secretions, fluids, solids, or gastric contents into the larynx and lower respiratory tract.^{1,2} It can cause complications, such as airway obstruction and aspiration pneumonia, and possibly death.^{1,3}

This article details the impact of a multidisciplinary improvement project to prevent aspiration in patients in an acute care setting. Patient safety was the primary focus of the project, and approval from the institution's internal review board was not necessary for its implementation. Additionally, the facility utilizes an evidence-based, ventilator-associated pneumonia protocol, so the project did not address specific endotracheal tube care as it relates to the prevention of aspiration, such as endotracheal tube cuff inflation or hypopharyngeal suctioning.

Background

New Hanover Regional Medical Center is a Level II regional trauma center with 692 beds. In 2015, two trauma patients who had survived multiple surgeries died due to aspiration after they were transferred to the nursing unit. An aspiration prevention team, including nurses, speech language pathologists (SLPs),

registered dietitians, informatics clinicians, and food and nutrition services (FNS) staff, was assembled to reduce the incidence of aspiration and decrease postadmission aspiration mortality.

A key realization for the team was that the facility had no standard process for managing aspiration risk. An informal survey of physicians and nursing staff revealed that respondents were aware of the

staff SLPs, the following factors were identified as increasing the risk for aspiration in the acute care setting:

- altered or declined mental status
- hoarseness, weak cough, wet or gurgling voice, and poor airway protection
- history of dysphagia, aspiration, or aspiration pneumonia
- residual food in mouth after swallowing
- decreased or absent breath sounds

Nurses are uniquely positioned to assess patients for aspiration risk before the first meal or liquid is given and throughout hospitalization.

existence of an aspiration prevention order, but they were unable to state specific strategies or tasks that should be triggered under this order. Improved education was necessary for the healthcare team, as well as patients and their caregivers.

There were no signs in the patient rooms to alert patients and visitors about aspiration prevention. Additionally, no processes were in place to identify at-risk patients, and only providers or SLPs could initiate an aspiration precautions order. Care plans for aspiration risk focused on speech therapy and rehabilitation with minimal goals and interventions for the nursing staff.

Risk factors

Risk for aspiration describes the degree to which patients are at risk for inhaling gastrointestinal secretions, oropharyngeal secretions, solids, or fluids into their tracheobronchial passages.¹ After a literature review and consultation with

- neurologic disorders, such as traumatic brain injury, stroke, Parkinson disease, multiple sclerosis, and dementia
- history of head or neck surgery
- history of radiation therapy for head and neck cancer
- presence or recent removal of endotracheal or tracheostomy tubes
- poor dentition or neglected oral care
- presence of gastrointestinal tubes
- presence of a cervical collar.

Placement of a feeding tube does not prevent aspiration of oral or gastric contents. Although nasogastric and percutaneous endoscopic gastrostomy (PEG) tubes are commonly used to address dysphagia, they can be associated with an increased risk of aspiration.^{1,3-5} Clinicians may believe that feeding tubes will solve the problem of possible pulmonary aspiration without exploring the effectiveness of other precautions. Nasogastric feeding tubes negatively affect the integrity of the lower esophageal sphincter and can provide

a track for gastric contents to enter a patient's airway.¹ Intolerance to enteral nutrition may result in abdominal distention, vomiting, and aspiration events.⁶ Gastric (chemical) aspiration complications often lead to acute respiratory distress syndrome, and mortality has been reported as high as 70%.^{1,3}

The efficacy of SLP interventions in reducing aspiration events is well documented, but no evidence-based, standardized aspiration precautions have been developed for nurses.⁷ In acute care settings, patients experience procedures and situations that present temporary aspiration risk, such as during recovery from general anesthesia. Nurses are accustomed to evaluating patients who have experienced stroke for dysphagia, but they are also uniquely positioned to assess patients for aspiration risk before the first meal or liquid is given and throughout hospitalization.⁷

Developing a protocol

The team developed a standard protocol for the identification and management of acute and critical care patients at risk for aspiration for the nursing staff, unlicensed assistive personnel (UAP), SLPs, and FNS. Computerized learning modules were developed for both the nursing staff and UAP, with opportunities available for continuing education.

The comprehensive nursing care plan for patients on aspiration precautions includes these elements:

- Patients are initially assessed by nurses on admission and routinely reassessed for risk of aspiration, and SLPs evaluate patients for dysphagia.
- The nursing staff initiates and discontinues aspiration precautions in patients receiving oral or enteral nutrition as appropriate.
- FNS staff are alerted via the electronic health record (EHR),

which interfaces a patient's order and alerts servers to place an orange placemat on his or her food tray.

- The EHR also notifies the central distribution department, via an order, of the need to send suction set up to the patient's bedside.
- A laminated aspiration precautions sign, written in either English or Spanish, is hung in the patient's room, providing education to the patient and caregivers regarding oral and enteral nutrition and/or N.P.O. status.
- Unless contraindicated, the head of the patient's bed is maintained at 30 to 45 degrees. When patients receive oral and/or enteral nutrition, the head of bed is maintained at 90 degrees.
- Per the nurse's judgment, patients receive one-on-one supervision at mealtimes as needed.
- Oral care is performed every 4 hours for N.P.O. patients; after meals, at bedtime, and as needed for patients who are able to take P.O. foods and fluids.
- A best-practice advisory window appears once a patient's electronic documentation is filed, indicating the appropriate care plan and aspiration precautions. Once accepted, the care plan is automatically added to the patient's EHR.
- Staff monitors patients for signs and symptoms of intolerance to enteral nutrition, including changes in breath sounds, abdominal distention, vomiting, abdominal discomfort, increased output from nasogastric or orogastric tubes, and high gastric residual volumes.⁸
- A nurse, UAP, or unit secretary is alerted via the call bell or phone when a patient's food is delivered. Servers must not leave an unattended food tray in front of the patient.
- To create organizational awareness, the FNS staff wears orange "Aspiration Champions" T-shirts every Tuesday.

Implementation

A primary objective of the multi-disciplinary team was to ensure implementation of the standardized process. The pilot aspiration protocol was developed to be as realistic as possible on paper to mirror how it would appear on the EHR. The process was piloted for 1 month and adjustments were made before the protocol went live to all nursing units.

Multiple methods were used to achieve hospital-wide education and awareness, including announcements in the facility newsletter, emails to clinical personnel, weekly nursing unit and FNS audits to assure compliance, education and coaching during unit huddles, online learning, and attendance at the organization's annual skills day to reinforce the protocols. Additionally, poster presentations of the interdisciplinary team's strategy from the Healthcare Quality Week and Trauma Symposium were displayed on nursing and FNS units and provider lounges.

Unrealized fears and unanticipated benefits

The team originally predicted a need to increase the size of the nursing staff to accommodate one-on-one feeding, but not all patients required one-on-one feeding. After educating patients and families on aspiration prevention, most patients needed only to be set up for meals to ensure they could eat safely. Staggered food tray deliveries also allowed patient feeding to be managed with no change to staffing levels.

One of the first encouraging signs that the program was making a real difference happened during the initial roll out. After noticing an aspiration precautions sign, a physical therapist sought out the nursing staff to notify them that a

beverage had been left in front of an unsupervised patient.

The occupational, respiratory, and physical therapy units have demonstrated ownership in the process by providing patient and staff guidance, and ongoing improvements in oral care have been facilitated by the nursing and SLP staff. Similarly, we did not anticipate the high level of enthusiasm from the FNS staff, who felt empowered to be making a difference in saving patient lives.

Challenges

An initial challenge was the process of handling multiple aspiration precaution orders that were still circulating in the EHR and needed to be deleted. A notable ongoing challenge has been the process of timing food tray delivery with nursing staff availability. The staff is currently piloting possible solutions, such as improved communication between food deliveries and nursing via a new phone system or simply having food storage cabinets available on the nursing units.

Results

The aspiration prevention protocol has provided a framework to assist nurses in assessing at-risk patients. Empowering nurses to initiate the appropriate aspiration precautions has provided a mechanism for the timely implementation of nursing actions to improve patient outcomes. The number of postadmission aspiration events has been reduced from 162 in 2015 to 154 in 2017. More importantly, the number of deaths associated with aspiration complications has been reduced by 17.94%, from 39 in 2015 to 32 in 2017. Mortality reductions from postadmission aspiration complications positively correlate with an increase in patients placed on aspiration precautions.

The development of standardized aspiration precautions based on a review of the existing literature, shared decision-making, and streamlined management principles has improved communication between the nursing disciplines, the informatics team, SLPs, dietitians, and the FNS department. Innovative EHR pathways and strategic nurse empowerment have resulted in one of the first evidence-based aspiration prevention processes for frontline clinicians in the acute care setting. ■

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