Preventing Aspiration in Older Adults with Dysphagia

Aspiration can lead to aspiration pneumonia, a serious health problem for older adults.
Overview: Dysphagia, the impairment of any part of the swallowing process, increases the risk of aspiration. Dysphagia and aspiration are associated with the development of aspiration pneumonia. While some changes in swallowing may be a natural result of aging, dysphagia is especially prevalent among older adults with neurologic impairment or dementia, leading to an increased risk of aspiration and aspiration pneumonia. This article discusses best practices for assessment and prevention of aspiration among older adults who are being hand-fed or fed by tube. To view an accompanying online video, go to http://links.lww.com/A226.

Benjamin Link, age 74, was admitted to the hospital for hip-replacement surgery related to crippling arthritis and chronic pain. (This case is a composite based on our experience.) He has a 12-year history of Parkinson’s disease and had been taking carbidopa–levodopa (Sinemet and others) 25–100 mg four times daily. Upon admission the medication was suspended because of preoperative fasting and then, later, postoperative nausea. This worsened his Parkinson’s symptoms, including difficulty in swallowing. Mr. Link is now drowsy as a result of the anesthesia and is receiving morphine by patient-controlled pump, both of which increase the risk of impaired swallowing, which could lead to aspiration.

On his second postoperative day, the nurse notices that Mr. Link is coughing while the nursing assistant gives him breakfast. She also hears gurgling sounds, which worsen after he drinks juice. Mr. Link is drooling and speaks in a soft, hoarse voice. He doesn’t have fever or chills, but on auscultation the nurse detects faint crackles in the base of Mr. Link’s left lung. The physician is notified; the nurse suspects that Mr. Link had been aspirating during meals.

IMPLEMENTING THE TRY THIS APPROACHES

Although the evidence available on the effectiveness of many preventive strategies is limited, the approaches summarized in Try This: Preventing Aspiration in Older Adults with Dysphagia (page 45) are the ones best known for decreasing the risk of aspiration in this population. (To understand the importance of this assessment, see Why Assess for Aspiration in Patients with Dysphagia? page 42.)

Dietary modifications are recommended by a speech pathologist or other clinician trained in the assessment of swallowing. Thickened liquids may be recommended. For example, one study found that patients with neurogenic dysphagia aspirated less often when liquids thickened to the consistency of nectar or pudding were provided than when thin liquids were given. But thickened liquids aren’t recommended in all cases of dysphagia; therefore, working with a speech pathologist to determine the specific needs of the patient is critical.

Oral care. Poor oral hygiene and tooth decay have been correlated with the occurrence of aspiration pneumonia, and good oral care has been associated with a lower rate of pneumonia. Mr. Link receives a bedside dysphagia workup by the speech pathologist. She observes no overt aspiration of liquids during the evaluation but determines that Mr. Link is at risk for dysphagia because of his age, Parkinson’s disease status, altered medication regimen, and sedation from the analgesia. Therefore, the nurse implements the Try This approaches to promote swallowing. The nurse asks the physical therapist to complete her work with
Mr. Link at least 30 minutes before mealtimes, which will allow him time to rest before eating. At mealtimes, the nurse helps Mr. Link to sit upright at a 45° angle, the highest permitted by postoperative orders. The nurse instructs the nursing assistant to feed Mr. Link slowly, giving him small amounts and alternating solids with liquids—all suggested in the Try This approaches.

Next, the nurse reviews Mr. Link’s medication list, looking for drugs that may be causing sedation and thus impairing the coughing or swallowing reflex. She also talks with Mr. Link about his home routine of eating meals and taking medications. She wants to get him back on a medication schedule to decrease the dysphagia and other symptoms of Parkinson’s disease.

To promote chewing and swallowing, the nurse looks for missing teeth or missing or poorly fitting dentures. She finds that his dentures fit well and that his oral hygiene is adequate. The nurse tells him about the importance of good oral hygiene, including cleaning his dentures and rinsing his mouth with mouthwash. (To watch the segment of the online video on preventing aspiration during hand feeding, go to http://links.lww.com/A227.)

**IMPLEMENTING THE TRY THIS APPROACHES FOR TUBE FEEDING**

Good oral hygiene is also important for patients fed by tube. In a comparison of three groups of institutionalized older adults (those fed orally, those fed by nasogastric tube, and those fed by percutaneous enterogastric tube), tube-fed patients had a higher prevalence of oropharyngeal pathogenic bacteria than those fed orally.21 Oral bacteria levels were highest in those receiving nasogastric tube feedings. This suggests to us that tube-fed patients (especially those receiving nasogastric feedings) are at higher risk for bacterial pneumonia if aspiration occurs than are those who receive oral feedings. (To see the segment of the online video on preventing aspiration during tube feeding, go to http://links.lww.com/A228.)

**Tube placement.** Correct placement of the feeding tube is also critical to the prevention of aspiration. A tube inadvertently positioned in the trachea or lung causes “aspiration by proxy” if tube feeding is initiated or medications are administered. In addition, a tube whose ports are situated in the esophagus increases the risk of regurgitation and aspiration.22 For these reasons, radiographic confirmation of placement is strongly recommended before a tube is first used. In adults, an abdominal X-ray is preferred over a chest X-ray; it can determine where the tube ends in the gastrointestinal tract.21 Thereafter, the nurse can use a variety of tests at the bedside to help determine the tube’s position: observing the length of the tube extending from the insertion site and the appearance and volume of fluid withdrawn from the tube, for example.24, 25 Contents withdrawn by a syringe from a gastric tube during feedings usually have the appearance of curdled or unchanged formula. While the pH of gastrointestinal contents is buffered by enteral formula, fluid withdrawn from gastric tubes usually has a lower pH than that of fluid withdrawn from small-bowel feeding tubes.26 The volume of fluid withdrawn from gastric tubes is typically higher than that withdrawn from small-bowel tubes.24

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review and recommendations of a panel of experts, this method is ineffective, perhaps toxic, and is no longer recommended. Further, the same panel of experts found that attempting to identify the presence of glucose-containing enteral formula by testing for glucose in tracheal secretions is ineffective and is also no longer recommended.

Pathophysiology. Dysphagia, defined as impairment of any part of the swallowing process, increases the risk of aspiration. Dysphagia and aspiration are associated with the development of aspiration pneumonia. The ability to swallow solid food and liquids depends on the interplay of as many as 50 pairs of muscles in the head and neck. While some changes in swallowing are a natural result of aging, dysphagia is often associated with or caused by neurologic impairment, which can interfere with the proper function of these muscle groups and in turn interfere with the closure of the larynx when food or liquid reaches the back of the tongue. These substances then can enter the trachea and lungs. Older adults, especially those with neurologic conditions such as stroke, Parkinson’s disease, dementia, and multiple sclerosis, are at risk for dysphagia and aspiration. Patients who have decreased alertness because of medications (including anesthesia and sedatives), medical conditions, or a combination of these, may have slowed gag and swallowing reflexes and, therefore, be less able to respond to regurgitation and vomiting.

Also, because chewing prepares food for swallowing, the absence of teeth—or the presence of poorly fitted dentures—increases the risk of aspiration, as does decreased saliva production. Poor oral hygiene promotes the growth of pathogenic organisms in the mouth, thereby increasing the risk of aspiration pneumonia.

Prevalence. Reports of the prevalence of dysphagia vary with study population, diagnosis, and treatment. According to a 1999 report from the Agency for Health Care Policy and Research, neurologic disorders—stroke, mostly—caused dysphagia in an estimated 300,000 to 600,000 Americans annually.

Researchers employing a dysphagia-screening questionnaire found that almost 14% of community-residing older adults reported symptoms consistent with dysphagia. Regan and colleagues found that 32% of adults seen by an acute and community health psychiatric service had dysphagia. Possible causes considered were adverse effects of psychotropic medications and, perhaps, decreased alerterness or a concomitant neurologic disorder. Frail patients, especially those with advanced disease, are also at increased risk for dysphagia. For example, in a study of 82 nursing home residents with eating problems, 55% had symptoms of dysphagia, but fewer than a quarter of those had received a formal swallowing evaluation. Aspiration pneumonia represents a significant proportion of all pneumonia cases. In one study, 30% of patients hospitalized with pneumonia from a continuing care facility had aspiration pneumonia. In a four-year study of men ages 60 and older, Langmore and colleagues found a 22% incidence of aspiration pneumonia, with the highest rate of 44% in nursing home residents. Predictors for aspiration pneumonia included being dependent on others for feeding or oral care, having more decayed teeth, and receiving tube feeding. In a later study, Langmore and colleagues identified 18 variables as significant predictors of aspiration pneumonia in nursing home residents; among these were the need for tracheal suctioning, being bedfast, being tube fed, and the presence of chronic obstructive pulmonary disease or congestive heart failure. Patients who are on ventilators and receive tube feedings are also at risk for aspirating.

One of us (NAM, with colleagues) found that 31% of tracheal secretions collected during suctioning of patients on ventilators were positive for pepsin, a digestive protease produced in the stomach, which is indicative of aspiration of stomach contents. There was evidence that 89% of patients on ventilators aspirated at least once in a three-day period. Those with frequent pepsin-positive specimens were at significantly greater risk for pneumonia. Additional risk factors for pneumonia in this study population included having the head of bed elevated less than 30°, having decreased consciousness (as measured by a Glasgow Coma Scale Score of less than 9), being sedated, and receiving opioids and paralytic agents. For more information, see Preventing Aspiration When a Patient Eats or During Hand-Feeding of the Patient, at http://links.lww.com/A362.
As the nurse suspected, Mr. Link’s modified barium swallow test shows a slowing of swallowing function. Aspiration is not noted. The nurse works with Mr. Link, his wife and daughter, the nursing assistant, and the speech pathologist to continue using the Try This approaches. His lung crackles resolve spontaneously. Mr. Link’s functional status improves and he is discharged home. The nurse instructs Mr. Link’s wife and daughter on how to do the Heimlich maneuver. A follow-up evaluation 30 days later shows an improvement in Mr. Link’s swallowing function. (For the segment of the online video on risk-reduction strategies, go to http://links.lww.com/A230.)

COMMUNICATING THE STRATEGIES
Mr. Link’s nurse will instruct him, as well as his family caregivers and nursing assistants, in strategies to promote swallowing. The nurse already requested the physical therapist to complete postoperative therapy at least 30 minutes before meals and will coordinate the prescribed bedside dysphagia evaluation with the speech pathologist. While the chin-flexed position may be helpful for Mr. Link, different positions may be better for others. For example, a patient recovering from head and neck surgery will need to work with a speech pathologist to determine the best feeding position to minimize the risk of aspiration during feeding. The occupational therapist and speech pathologist can be helpful in determining the correct feeding position for patients. The nurse will arrange and coordinate the prescribed dietetic assessment and assure that Mr. Link receives the correct diet. (To view the segment of the online video on assessing and preventing aspiration, go to http://links.lww.com/A229.)

Symptoms of Dysphagia and Aspiration

Symptoms of dysphagia and aspiration may include the following:
- coughing during meals
- hoarse voice following meals
- gurgling sounds in the throat
- drooling
- upper respiratory infection
- pneumonia

Symptoms of Aspiration Pneumonia in Older Adults

Any of the following symptoms should alert the practitioner that the patient may have aspiration pneumonia.
- elevated respiratory rate
- fever
- cough
- chills
- pleuritic chest pain
- crackles (rales)
- delirium, increased confusion, or falls

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CONSIDER THIS

What are the considerations for special populations? The need to promote swallowing and decrease the risk of aspiration in patients may be indicated for a variety of medical conditions. A patient with advanced dementia may forget how to chew or swallow, and it may be helpful for a nurse to demonstrate chewing or to gently stroke the area under the chin with a downward motion while the patient is swallowing. A pureed diet may be indicated to decrease the risk of choking. Patients with advanced dementia or hemiparesis, localized disease or injury affecting the oropharyngeal area, may unknowingly pocket food in their cheeks; it’s important to visually inspect the oral cavity for food (including under the dentures) during and after meals. These patients are at risk for choking or aspirating if left unobserved with food in their mouths. In addition, in patients with hemiparesis or oropharyngeal disease or injury, the caregiver can place the food on the side of the mouth that doesn’t have weakness or paralysis.

What are the ethical considerations of using feeding tubes in patients with dementia? A 1999 cross-sectional study by Mitchell and colleagues found that 34% of residents with advanced cognitive impairment in Medicare- or Medicaid-certified nursing homes had feeding tubes. However, the wisdom of placing feeding tubes in this population has been questioned. In a review article, Finucane

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WHY: Aspiration (the misdirection of oropharyngeal secretions or gastric contents into the larynx and lower respiratory tract) is common in older adults with dysphagia and can lead to aspiration pneumonia. In fact, it has been suggested that dysphagia carries a sevenfold increased risk of aspiration pneumonia and is an independent predictor of mortality (Singh & Hamdy, 2006).

TARGET POPULATION: Dysphagia is common in persons with neurologic diseases such as stroke, Parkinson’s disease, and dementia. The older adult with one of these conditions is at even greater risk for aspiration because the dysphagia is superimposed on the slowed swallowing rate associated with normal aging. Conditions that suppress the cough reflex (such as sedation) further increase the risk for aspiration.

BEST PRACTICES: ASSESSMENT AND PREVENTION ASSESSMENT

Aspiration:

Although aspiration during swallowing is best detected by procedures such as video-fluoroscopy or fiberoptic endoscopy, clinical observations are also important. Symptoms to look for include:

- Sudden appearance of respiratory symptoms (such as severe coughing and cyanosis) associated with eating, drinking, or regurgitation of gastric contents.
- A voice change (such as hoarseness or a gurgling noise) after swallowing.
- Small-volume aspirations that produce no overt symptoms are common and are often not discovered until the condition progresses to aspiration pneumonia.

Aspiration Pneumonia:

- Older persons with pneumonia often complain of significantly fewer symptoms than their younger counterparts; for this reason, aspiration pneumonia is under-diagnosed in this group (Marrie, 2000).
- Delirium may be the only manifestation of pneumonia in elderly persons (Marrie, 2000).
- An elevated respiratory rate is often an early clue to pneumonia in older adults; other symptoms to observe for include fever, chills, pleuritic chest pain and crackles (Marrie, 2002).
- Observation for aspiration pneumonia should be ongoing in high-risk persons.

PREVENTION OF ASPIRATION DURING HAND FEEDING:

There is little research-based information regarding specific strategies to prevent aspiration during the feeding of dysphagic individuals (Loeb, et al, 2003). However, the following actions may be of some benefit:

- Provide a 30-minute rest period prior to feeding time; a rested person will likely have less difficulty swallowing.
- Sit the person upright in a chair; if confined to bed, elevate the backrest to a 90-degree angle.
- Slightly flexing the person’s head to achieve a ‘chin-down’ position is helpful in reducing aspiration in some types of dysphagia (Shanahan, et al, 1993). Swallowing studies may be needed to determine which individuals are most likely to benefit from this position.
- Adjust rate of feeding and size of bites to the person’s tolerance; avoid rushed or forced feeding.
- Alternate solid and liquid boluses.
- Vary placement of food in the person’s mouth according to the type of deficit. For example, food may be placed on the right side of the mouth if left facial weakness is present.
- Determine the food viscosity that is best tolerated by the individual. For example, some persons swallow thickened liquids more easily than thin liquids. A recent study showed that increasing food viscosity greatly improved swallowing in neurological patients (Clave, et al, 2006). That is, aspiration was significantly lower when nectar or pudding was swallowed (as compared to when liquids were swallowed).
- Minimize the use of sedatives and hypnotics since these agents may impair the cough reflex and swallowing.
- Evaluate the effectiveness of cueing, redirection, task segmentation and environmental modifications (minimizing distractions) as alternatives to hand feeding. (See Try This: Assessing Eating and Feeding Issues in Older Adults with Dementia).

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PREVENTION OF ASPIRATION DURING TUBE FEEDING:

Persons who aspirate oral feedings are also likely to aspirate tube feedings, either by nasogastric or gastrostomy tubes (Siddique, et al, 2000). Therefore, there is a growing trend to avoid the use of tube feedings merely as a means to prevent aspiration. Nonetheless, there are instances in which tube feedings are needed, especially during periods of acute illness. When tube feedings are necessary, the following activities may help to minimize aspiration:

- Keep the bed’s backrest elevated to at least 30° during continuous feedings.
- When the tube-fed person is able to communicate, ask if any of the following signs of gastrointestinal intolerance are present: nausea, feeling of fullness, abdominal pain or cramping. These signs are indicative of slowed gastric emptying that may, in turn, increase the probability for regurgitation and aspiration of gastric contents.
- Measure gastric residual volumes every 4 to 6 hours during continuous feedings and immediately before each intermittent feeding. This assessment is especially important when the tube-fed person is unable to communicate signs of gastrointestinal intolerance. Although there is no convincing research-based information regarding how much gastric residual volume is ‘too much,’ a persistently elevated volume (such as greater than 200 ml) should raise concern (McClave, et al, 2002).
- A prokinetic agent (such as metoclopramide or erythromycin) may be prescribed to alleviate persistently slowed gastric emptying (McClave, et al, 2002).
- Post-pyloric placement of the feeding tube (jejunostomy) may be prescribed if persistently slowed gastric emptying is a problem (McClave, et al, 2002). The efficacy of this action is controversial.
- Pump assisted feedings may be associated with fewer aspiration events than are gravity–controlled feedings in bedridden patients with gastrostomy tubes (Shang, et al, 2004).

PREVENTION OF ASPIRATION PNEUMONIA BY ORAL CARE:

Missing teeth and poorly fitted dentures predispose to aspiration by interfering with chewing and swallowing. Infected teeth and poor oral hygiene predispose to pneumonia following the aspiration of contaminated oral secretions (Quagliarello, et al, 2005; Marrie, 2000). Therefore, there is a growing trend to avoid the use of tube feedings merely as a means to prevent aspiration. Persons who aspirate oral feedings are also likely to aspirate tube feedings, either by nasogastric or gastrostomy tubes (Siddique, et al, 2000). Therefore, there is a growing trend to avoid the use of tube feedings merely as a means to prevent aspiration. Nonetheless, there are instances in which tube feedings are needed, especially during periods of acute illness. When tube feedings are necessary, the following activities may help to minimize aspiration:

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MORE ON THE TOPIC:

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Marrie, T.J. (2002). Pneumonia in the long-term care facility. *Infection Control and Hospital Epidemiology, 23*(3), 159-164.


and colleagues noted a lack of evidence showing that tube feedings result in weight gain or reduced aspiration in those with advanced dementia. Also, a 1992 study of 40 neurologically impaired nursing home residents (including seven with dementia) who received tube feedings found that they continued to lose weight and lean body mass. There is also no evidence that tube feedings promote survival or decrease aspiration in patients with severe Alzheimer’s disease. Less social interaction during mealtimes is a drawback to tube feedings, as is the loss of pleasure that comes with feeling, tasting, and swallowing food. Further, tube feedings may cause diarrhea and abdominal discomfort. For these reasons, the Alzheimer’s Association discourages the use of feeding tubes in people with advanced Alzheimer’s disease but respects patient and surrogate preferences. Initiating tube feedings in this population is an individual or family decision with possible legal, cultural, and religious implications and remains a highly controversial ethical issue for some.

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References


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**GENERAL PURPOSE:** To present registered professional nurses with information on best practices for the assessment and prevention of aspiration among older adults who are being hand fed or fed by tube.

**LEARNING OBJECTIVES:** After reading this article and taking the test on the next page, you will be able to:

- outline the background information helpful for understanding the problems of dysphagia and aspiration, including risks, manifestations, and incidence.
- plan the appropriate interventions for patients at risk for aspiration.

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