



# Evidence-Based Best Practices: Managing Aspiration Risk

## Overview

Aspiration occurs when oropharyngeal secretions, food particles, or gastric contents are inhaled into the respiratory tract, often resulting in aspiration pneumonitis or aspiration pneumonia.<sup>1</sup>

- Aspiration Pneumonitis: Chemical injury to the tracheobronchial tree and lung caused by acute, often witnessed, inhalation of regurgitated sterile gastric contents (gastric acid).
- Aspiration Pneumonia: Infection caused by inhaling oral secretions, stomach contents, or both into the lung, leading to colonization by bacteria.

Between 1999 and 2017, over 300,000 deaths were reported due to aspiration pneumonia, with people aged 75 or older making up over three-quarters of those deaths.<sup>2</sup>

## Risk Factors for Aspiration

- Chronic illness that can affect chewing, swallowing, or positioning, such as stroke, head injury, multiple sclerosis, Parkinson's disease, Alzheimer's disease or other dementia-related disorder
- Changes in consciousness that could compromise the cough reflex and glottal closure
- Upper gastrointestinal tract disorders, including esophageal disease, surgery that involves the upper airway or esophagus, or gastric reflux
- Mechanical disruption of the glottal closure or cardiac sphincter due to an artificial airway, bronchoscopy, upper endoscopy, or nasogastric feeding
- Pharyngeal anesthesia
- Protracted vomiting, large volume tube feedings, or gastrostomy feeding
- Being placed in a recumbent position

Anyone with risk factors for aspiration should be thoroughly evaluated, including a review of his/her medical history. Referral for a speech-language pathology evaluation may be necessary, including an oral-pharyngeal swallowing evaluation and recommendations for changes in food texture and/or thickness of fluids.

Other assessments that may be needed include:

- Occupational therapy for positioning during meals and when in bed
- Nutritional assessment
- Dental evaluation

A medication regimen review can help staff identify medications that increase reflux:<sup>3</sup>

- Benzodiazepines such as diazepam, alprazolam, lorazepam
- Barbiturates such as secobarbital, butabarbital, phenobarbital
- Anticholinergics such as atropine, oxybutynin, ipratropium
- Calcium channel blockers such as amlodipine, diltiazem, nifedipine, verapamil
- Non-steroidal anti-inflammatories such as aspirin or ibuprofen

*Note: Many other medications may also exhibit anticholinergic effects. For example: diphenhydramine, selegiline, tramadol, codeine, some antidepressants, and antipsychotics. See the [2023 American Geriatrics Society Beers Criteria® for Potentially Inappropriate Medications Use in Older Adults](#) for more information.*

Some medications may have sedating effects that can impair swallowing, such as sedatives, hypnotics, and antipsychotics.

## **Managing Aspiration Risk**

Managing aspiration risk is an interdisciplinary process, requiring input from all team members. Direct care staff should monitor the person and notify the licensed nurse if he/she is coughing or clearing their throat when eating or drinking.

Swallowing studies (including modified barium swallow and video fluoroscopic swallowing studies) can help assess for any deficits and identify appropriate interventions.

Interventions to reduce aspiration risk may include:<sup>4</sup>

- Monitoring medication regimen and noting any medications that can increase gastric reflux or those that impair swallowing
- Dietary modifications – changes in diet texture, cutting food into bite sized pieces, thickened liquids

- Positioning during meals and maneuvers for swallowing – chin tuck, head turned, sitting in an upright position
- Monitoring for food left in the mouth after swallowing, or pain with swallowing
- If eating in bed, maintaining the head of the bed at a 30 to 45-degree angle
- Feeding assistance – hand-over-hand, hand-under-hand, or other techniques as appropriate
- Encouraging the person to take small bites and swallow frequently
- Adaptive equipment as recommended by the occupational therapist or speech-language pathologist
- Maintaining a quiet environment with limited distractions
- Rehabilitation programs as recommended by the speech-language pathologist
- Maintaining oral hygiene
- Pharmacological and/or surgical interventions as indicated by the physician
- Ensuring the appropriate endotracheal cuff pressure in anyone with a tracheostomy

Neurostimulation may be beneficial in some situations, including neuromuscular electrical stimulation, thermal tactile stimulation, or other chemical, physical, or electrical stimulation.<sup>5</sup>

Long-term use of a nasogastric tube feeding should be avoided. If long-term enteral nutrition therapy is recommended, the person will usually have a gastrostomy, jejunostomy or other permanent feeding tube placement.

- Monitor residuals in people receiving enteral nutrition
- Notify the physician if residuals exceed established parameters
- Keep the head of the bed elevated to 30-45 degrees

## **Symptoms of Aspiration**

Small-volume (or “silent”) aspiration may not produce any overt symptoms; it is often diagnosed when the person’s O<sub>2</sub> saturation drops, and aspiration is identified by chest x-ray. Others may exhibit very dramatic symptoms with rapid progression to severe respiratory distress and even death.<sup>1</sup> Staff should be alert for:

- Regurgitated food particles or other gastric contents observed in the oropharynx

- Sudden onset of respiratory symptoms, such as severe coughing or cyanosis associated with eating, drinking, or with regurgitation of gastric contents
- Voice changes after swallowing, such as hoarseness or gurgling noises

## Oral and Dental Care in Aspiration Pneumonia

Infected teeth and poor dental care can predispose people to aspiration pneumonia due to the aspiration of contaminated oropharyngeal secretions. Preventing bacterial colonization of the oropharynx is an important measure in avoiding aspiration pneumonia.

- Meticulous oral hygiene, as well as treatment of dental caries and periodontal disease may reduce bacterial colonization
- Edentulous people may have decreased bacterial colonization, therefore less risk of aspiration pneumonia
- Missing teeth and poorly fitted dentures may interfere with chewing and swallowing, increasing the risk of aspiration
- Poor oral hygiene and tooth decay increase the risk of developing aspiration pneumonia
- If the person cannot remove oral secretions effectively, suctioning may be needed

Brushing the teeth one to three times daily can be effective at reducing the risk of aspiration pneumonia.

Appropriate denture care is important as well. Ensure dentures fit properly and are cleaned regularly.

## Recognizing Aspiration Pneumonia

Aspiration pneumonia can vary from a mild to critical illness; the severity may depend on other health conditions and the specific organism that causes the infection. Common pathogens include *Haemophilus influenzae* and *Streptococcus pneumoniae* – organisms that often colonize the naso-and-oropharynx.

Aspiration of gastric contents can lead to a chemical injury, which can result in a bacterial superinfection. Normal gastric contents are sterile due to the level of acidity; however, people with gastroparesis, small bowel obstruction, or those using antacids are at higher risk for bacterial growth due to reduced acidity of gastric contents.

Signs and symptoms of aspiration pneumonia include:

- Frequent coughing or productive cough

- Shortness of breath, wheezing, unusually rapid respirations
- Fever, chills, sweating
- Chest pain when coughing or deep breathing
- Malaise and myalgia
- Dizziness, syncope, feelings of anxiety, headache
- Cyanosis of the skin, lips, or fingernails
- Anorexia, nausea and vomiting

Diagnosis is generally made after a physical examination, including an assessment of the heart and lungs.

- Distinct sounds caused by the narrowing of airways, or inflammation/fluid in the normally air-filled parts of the lungs
- Bubbling or crackling breath sounds
- Diminished breath sounds

Diagnostic tests that are often ordered include:

- Chest x-ray, CT scan of the chest
- Labs – complete blood count, basic metabolic panel, blood cultures, sputum or tracheal culture, arterial blood gases

## **Treating Aspiration Pneumonia and Aspiration Pneumonitis**

Treatment for aspiration pneumonia may require hospitalization. If intubation is not required, humidified oxygen will be administered with close monitoring of the person's O<sub>2</sub> saturation. In severe cases with hypoxia, mechanical ventilation may be necessary.<sup>6</sup>

If a large volume of secretions or food particles were aspirated, bronchoscopy may be needed to remove aspirate and obtain samples for culture.

The choice of antibiotics for aspiration pneumonia will depend upon the specific organism involved. Prophylactic use of antibiotics for aspiration pneumonitis is generally not recommended, unless the person has small bowel obstruction or other conditions that could result in colonization of gastric contents.

The routine use of corticosteroids for aspiration pneumonitis is also not recommended; several studies have demonstrated no benefit and one study found that those given corticosteroids had longer ICU stays than those who did not receive corticosteroids.<sup>1</sup>

If aspiration of gastric contents is witnessed, suctioning of the upper airway should occur.

## Resources

BMC Geriatrics - [Interventions to Prevent Aspiration in Older Adults Living in Nursing Homes: A Scoping Review](#)

Drugs.Com - [Aspiration Precautions](#)

Centers for Disease Control and Prevention (CDC) – [Oral Health in Healthcare Settings to Prevent Pneumonia Toolkit](#)

CDC – [Guidelines for Preventing Healthcare-Associated Pneumonia, 2003](#)

Hartford Institute for Geriatric Nursing - [Preventing Aspiration in Older Adults with Dysphagia](#)

- [How to Try This: Preventing Aspiration in Older Adults with Dysphagia](#) (Video)

National Institutes of Health (NIH), National Library of Medicine (NLM) - [Stat Pearls: Aspiration Risk](#)

NIH, NLM – [Stat Pearls: Chronic Aspiration](#)

NIH, NLM – [Stat Pearls: Aspiration Risk \(Nursing\)](#)

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<sup>1</sup> Marik PE. [Aspiration Pneumonitis and Aspiration Pneumonia](#). N Engl J Med 2001; 344:665-671.

<sup>2</sup> Gupte T, Knack A, Cramer JD. [Mortality from Aspiration Pneumonia: Incidence, Trends, and Risk Factors](#). Dysphagia. 2022 Dec;37(6):1493-1500. doi: 10.1007/s00455-022-10412-w. Epub 2022 Jan 31. PMID: 35099619.

<sup>3</sup> 2023 American Geriatrics Society Beers Criteria® Update Expert Panel. [American Geriatrics Society 2023 updated AGS Beers Criteria® for potentially inappropriate medication use in older adults](#). J Am Geriatr Soc.2023;71(7):2052-2081. doi:10.1111/jgs.18372

<sup>4</sup> Chen s, Kent B, Cui Y. Interventions to prevent aspiration in older adults with dysphagia living in nursing homes: a scoping review. BMC Geriatrics 2021; 429. <https://doi.org/10.1186/s12877-021-02366-9>

<sup>5</sup> Bath PM, Woodhouse LJ, Suntr-Krueger S, et al. [Pharyngeal electrical stimulation for neurogenic dysphagia following stroke, traumatic brain injury or other causes: Main results from the PHADER cohort study](#). J.eclinm.202.100608.

<sup>6</sup> Sanivarapu RR, Gibson J. [Aspiration Pneumonia](#). [Updated 2023 May 8]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan.