

Thomas Jefferson University

## Preventing Aspiration Pneumonia: A Team Approach

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### FOCUS Objectives

- Identify several measures that can be used to prevent aspiration pneumonia.
- Review indications and contraindications for feeding tube placement, including discussion of benefit vs. burden.
- Practice having difficult conversations regarding management of patients with aspiration.

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### Detailed Objectives

- Describe the incidence of aspiration pneumonia
- Identify key risk factors
- Diagnosis and Treatment of Aspiration
- Utilization of the interdisciplinary team
- Identify several measures that can be used to prevent aspiration and aspiration pneumonia.
- Review indications and contraindications for tube feeding, including discussion of benefit vs. burden.
- Practice having difficult conversations regarding management of patients with recurrent aspiration.

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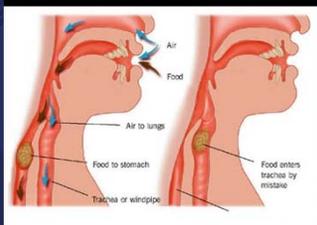
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### What is Aspiration?

- Defined as inhalation of oropharyngeal or gastric contents into the lower respiratory tract.
- This can include:
  - Gastric acid
  - Food particles
- Can result in multiple sequelae



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### What is Aspiration?

- Sequelae:
  - Chemical Pneumonitis
  - Bacterial Infection (abscess, pneumonia, etc.)
  - Mechanical Airway Obstruction



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### What is Chemical Pneumonitis?

- Typically occurs after inhalation of gastric materials
- Acidic inoculum results in inflammation of the airway
- Clinically:
  - Hypoxemia
  - Respiratory distress
  - Desaturation
- Often seen post-anesthesia
- THIS IS VERY COMMON!!!!!!!

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### What is Chemical Pneumonitis?

- Does not necessarily require antibiotics!!!
- This is a clinical judgment typically based on time.
  - Recovery typically seen within 24-36 hours of onset, sometimes sooner.
  - May or may not have radiographic findings on X-ray
  - Lack of purulent sputum and fever
- Use caution in starting antibiotics on every patient with aspiration event...
  - More to come on treatment later...

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### How common in the Long Term Care (LTC) Setting?

- LTC residents have a 3 fold risk of aspiration compared to their community dwelling counterparts.
- Second most common cause of infection, hospital transfer and mortality.

1. Reza Shariatzadeh M, Huang JQ, Marrie TJ. Differences in the features of aspiration pneumonia according to site of acquisition: community or continuing care facility. J Am Geriatr Soc. 2006;54(2):296-302.

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### How common in the Long Term Care (LTC) Setting?

- One of the most common causes of Nursing Home Acquired Pneumonia (NHAP).
  - According to one study, 18% of patients with NHAP have aspiration pneumonia.
  - However, only 5% of patients with community acquired pneumonia (CAP) have signs of aspiration.
- Another study cites the incidence of witnessed aspiration leading to pneumonia in the nursing home setting as having an odd's ratio (OR) of 13.9

Marrie TJ, Durant H, Kwan C. Nursing home-acquired pneumonia. A case-control study. J Am Geriatr Soc. 1986;34(10):697-702.  
Vergis EN, Brennan C, Wagner M, Muder RR. Pneumonia in long-term care: a prospective case-control study of risk factors and impact on survival. Arch Intern Med. 2001;161(19):2378-2381.

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### Mortality Among Nursing Home Residents

- Mortality is high!!!
  - A prospective study of 108 patients with pneumonia were followed over the course of a year.
  - 19% mortality at 14 days
  - 59% mortality at 1 year
  - 75% mortality at 2 years
  - These results have been repeated in other similar studies.
- **BOTTOM LINE: THE RISK OF MORTALITY IS STAGGERING IN THIS VULNERABLE POPULATION**

Muder RR, Brennan C, Swenson DL, Wagener M. Pneumonia in a long-term care facility. A prospective study of outcome. Arch Intern Med. 1996;156(20):2365-2370.

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### Diagnosing Aspiration Pneumonia

- Presenting symptoms are highly variable.
  - Typically will see a slow indolent course that evolves over time.
  - This is mostly a clinical diagnosis
  - Most common signs/symptoms:
    - Fevers (although elderly won't always mount a fever)
    - Absence of rigors
    - Foul smelling sputum
    - Association with dysphagia and periodontal disease
    - Complications including abscess, empyema or necrosis.

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### Diagnosing Aspiration Pneumonia

- Don't count on labs like WBC as many elderly won't mount an inflammatory response.
- X-ray may have a lag in time to appropriate image
  - If upright during aspiration event common to see infiltrates in lower lobes.
  - If supine common to see in the upper lobes.
- CT scan may be most reliable in proving whether or not there is a pneumonia.

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Aspiration pneumonia (with bacteria)	Chemical Pneumonitis
<ul style="list-style-type: none"><li>• Slow insidious onset</li><li>• Gradual worsening of symptoms over &gt;72 hours</li><li>• Fever, elevated WBC</li><li>• Responds to antibiotics</li></ul>	<ul style="list-style-type: none"><li>• Recovers within 24-36 hours</li><li>• Can occur with or without a bacterial infection.</li><li>• Prominent dyspnea at onset of symptoms.</li><li>• Severe rapid hypoxemia followed by relatively quick recovery with pulmonary supportive care</li></ul>

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### Algorithm for how to treat aspiration



Courtesy of AAFP.

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### Microbiology of interest

- A wide variety of bacteria play a role in aspiration pneumonia
  - Gram negative bacteria have been found to make up majority of cultured isolates (49%)
    - Most common bacteria: fusobacterium, bacteroides spp., prevotella
  - Anaerobes (next slide) make up the next largest subset (16%)
  - Staph aureus (12%)

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### Microbiology of interest

- Beware of anaerobic bacteria
  - Dominant organism of the upper airway.
  - Commonly overgrown in patients with periodontal disease.
  - Aspirates of pleural fluid and transthoracic cultures yield approximately 62-93% with anaerobic bacteria.
    - This number is much lower in sputum samples.
- **BOTTOM LINE: OFTEN A MIXED INFECTION REQUIRING BROAD SPECTRUM COVERAGE**

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### Treatment for aspiration pneumonia

- Antibiotics:
  - Need to cover for most of your bacteria
- Clindamycin
  - PO DRUG OF CHOICE
  - Lowest rate of recurrent infection
- Ampicillin/sulbactam
- Imipenem
- Augmentin + Flagyl
  - An alternative regimen
- Can consider moxifloxacin although limited evidence
- If requiring MICU level of care should consider vancomycin for staph coverage.

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### Preventing Aspiration Pneumonia

- Despite treatments available even in the best tertiary care centers, mortality remains high.
- Nursing homes are under great scrutiny to deliver quality medical care
- Utilization of interdisciplinary medical teams including providers of different disciplines may help prevent worsening morbidity and mortality.
- This includes maximizing resources and referrals from:
  - Nursing
  - Speech Language Pathology
  - Pharmacy
  - Dentistry

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### Dysphagia

- Defined as a subjective sensation of difficulty or abnormality of swallowing.
- Known cause of aspiration in elderly with approximately 15% of older adults being effected.
- Referrals to ENT for dysphagia:
  - 70% are for persons older than 60
  - Two times more referrals in patients from 80-89 years old
  - Three times more referrals in patients older than 90 years old

Marrs G, Hendry GJ, Cameron D. Swallowing function after stroke: prognosis and prognostic factors at 6 months. Stroke. 1999;30(4):744-749.  
Barcel S, Sullivan PA, Robbins J. How should dysphagia care of older adults differ? Establishing optimal practice patterns. Semin Speech Lang. 2000;21(3):347-351.  
Luder SB, Suttler DM. An epidemiologic study on aging and dysphagia in the acute care hospitalized population. 2000;2007. Gerontology. 2009;55(6):714-718.

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### Dysphagia - Age as a risk factor

- Advancing age on its own is an independent risk factor for dysphagia.
  - Swallowing is a complicated physiologic movement involving both muscles and neurological parts.
- Among surveyed community dwelling patients approximately 13.8% report complaints of dysphagia.
- However, in nursing homes, this may be considerably higher.
- According to a 2013 South Korean study, a prevalence of 52.7% of nursing home residents were found to have dysphagia.

Park YH, Han HR, Oh BM, et al. Prevalence and associated factors of dysphagia in nursing home residents. Geriatr Nurs. 2013;34(3):212-217.

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### Dysphagia - Risk Factors

- Many comorbidities may lead to further risk of dysphagia:
  - Neurologic diseases
  - Stroke
  - Dementia
  - Cerebral Palsy
  - Traumatic Brain Injury
  - Parkinson's disease
  - Tumors effecting the nasopharyngeal tract
  - Achalasia

Mann G, Hankey GJ, Cameron D. Swallowing function after stroke: prognosis and prognostic factors at 6 months. Stroke. 1999;30(4):744-748.  
Martino G, Foley N, Bhargava S, Diamant N, Speechley M, Tezzell R. Dysphagia after stroke: incidence, diagnosis, and pulmonary complications. Stroke. 2005;36(12):2756-2763.  
Hollerer J, Roberts MJ, Ebersole TR, Cook DR. Swallowing in Alzheimer's disease. Alzheimer Dis Assoc. 1994;9(3):177-189.  
Chaplin RB. Nutritional factors relevant to Alzheimer's disease. J Am Diet Assoc. 1989;89(3):392-396.  
Morley JE. Nutrition in the elderly. Curr Opin Gastroenterol. 2002;18(2):240-245.

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### Dysphagia - Risk Factors

- When considering stroke:
  - As many as 50% of post-stroke patients report symptoms of dysphagia.
  - Post-stroke patients have been documented to have a 3-fold increased risk of developing pneumonia.
  - If these patients also were known aspirators, their risk jumps 11-fold.

Mann G, Hankey GJ, Cameron D. Swallowing function after stroke: prognosis and prognostic factors at 6 months. Stroke. 1999;30(4):744-748.  
Martino G, Foley N, Bhargava S, Diamant N, Speechley M, Tezzell R. Dysphagia after stroke: incidence, diagnosis, and pulmonary complications. Stroke. 2005;36(12):2756-2763.

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### Dysphagia - Risk Factors

- Dementia
  - Swallowing abnormalities are seen in 45% of institutionalized person with dementia.
  - This is part of the natural course of Alzheimer's dementia and should be part of the anticipatory guidance for caretakers of people with the disease.

Horner J, Albers MJ, Dawson DV, Cook GM. Swallowing in Alzheimer's disease. *Alzheimer Dis Assoc Disord.* 1994;8(2):177-189.  
Claggett MS. Nutritional factors relevant to Alzheimer's disease. *J Am Diet Assoc.* 1989;89(3):392-396.

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### Management of Dysphagia

- Maximizing safety, specifically during oral feeding is the most important prevention strategy
  - Posture changes
  - Swallowing therapy
  - Dietary modification
  - Tube feeding - when vs. when not

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### The Speech Language Pathology (SLP) Assessment

- Interventions led by speech language pathology have been shown to help improve swallowing function
- The speech language pathology assessment:
  - History and Physical
  - Assessment:
    - Oral structures and their function
    - Speech and vocal quality
    - Ability to protect airway
    - Coordination of respiration and swallowing with various size bolus and consistencies.

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**Recommendations for Safe Feeding**

- In patients with oral-assisted feedings, many strategies exist to prevent aspiration:
  - Enable patient to rest 30 minutes before feeds
  - Upright seating
  - Elevate back to 90 degrees
  - Chin down posture feeding
  - Small sized bites

Metheny NA. Preventing aspiration in older adults with dysphagia. Try this: general assessment series. [http://consultgerim.org/uploads/File/trythis/try\\_this\\_20.pdf](http://consultgerim.org/uploads/File/trythis/try_this_20.pdf). Published 2012. Accessed July 29, 2014.

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**Recommendations for Safe Feeding**

- Oral feeds (continued)
  - Alternate solids and liquids
  - Place food based on deficit (L side weakness place food on R)
  - Match viscosity with patients tolerance
  - Avoid sedating medications that may inhibit cough or swallowing before feeds.
  - Minimize distractions

Metheny NA. Preventing aspiration in older adults with dysphagia. Try this: general assessment series. [http://consultgerim.org/uploads/File/trythis/try\\_this\\_20.pdf](http://consultgerim.org/uploads/File/trythis/try_this_20.pdf). Published 2012. Accessed July 29, 2014.

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**Recommendations for Safe Feeding**

- Patients with tube feeds
  - Keep bed elevated to at least 30 degrees
  - If patient can communicate ask about signs of possible residual feeding volume (i.e. nausea, abdominal pain or cramping)
  - Measure residual volumes q4-6 hours during continuous feeds and prior to intermittent feeding.
  - Consider pro-kinetic agents (i.e. reglan) for residuals > 250 cc.

Metheny NA. Preventing aspiration in older adults with dysphagia. Try this: general assessment series. [http://consultgerim.org/uploads/File/trythis/try\\_this\\_20.pdf](http://consultgerim.org/uploads/File/trythis/try_this_20.pdf). Published 2012. Accessed July 29, 2014.

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### Video-fluoroscopic Swallowing (VFS) Evaluation

- A modified barium swallow study that can be done to examine all stages of the oropharyngeal swallow.
- Allows SLP and radiologists to analyze the types of foods that result in aspiration and what the compensatory mechanism is.
- Can analyze the anatomy including the stomach and esophagus.
- Identifies strictures and assesses motility.

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### Fiber-optic examination of oropharyngeal swallowing

- Use of laryngoscope and endoscope to analyze swallowing function
- Visualization of structures that can often provide different information compared to the VFS.

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### Postural strategies

- Head back
  - Use for inefficient oral transit
  - Poorly functioning posterior tongue
  - Gravity clears oral cavity
- Chin down
  - Delay in pharyngeal swallowing
  - Reduced posterior motion of base of tongue
  - Narrows airway entrance and pushes epiglottis
- Head tilt
  - Unilateral oral and pharyngeal weakness
  - Tilt head to the stronger side

Logemann, Jeri. Evaluation and Treatment of Swallowing Disorders (p.168). Austin, TX, 1998.

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**Food texture and viscosity**

- Management of volume and viscosity
  - Pureed diet:
    - Blenderized food with added liquid to form smooth consistency, no chewing needed.
    - Ex. Applesauce, yogurt, moist mashed potatoes.
    - Used in patients with reduced tongue function, esophageal strictures, reduced laryngeal closure
  - Mechanically altered diet:
    - Ground, finely chopped foods that form a cohesive bolus with minimal chewing.
    - Ex. Pasta, soft egg, cottage cheese, ground beef
    - Limited chewing due to poor tongue control

Oxford textbook of Palliative Nursing, 3<sup>rd</sup> ed, Ferrell BR, Coyle N (Eds), Oxford University Press 2010.

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**Food texture and viscosity**

- Soft, moist diet
  - Naturally soft foods requiring some chewing; moistened foods
  - Ex. Soft meats, canned fruit, baked fish.
  - Use in patients with reduced endurance for long meals.

Oxford textbook of Palliative Nursing, 3<sup>rd</sup> ed, Ferrell BR, Coyle N (Eds), Oxford University Press 2010.

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**Food texture and viscosity**

- Honey consistency:
  - Similar in viscosity to honey
  - Can be made using thickener
  - Use when reduced oral or lingual control, delayed swallowing and recurrent aspiration.
- Nectar consistency
  - Similar to tomato juice
  - Reduced bolus control
  - Delayed swallow and recurrent aspiration.

Oxford textbook of Palliative Nursing, 3<sup>rd</sup> ed, Ferrell BR, Coyle N (Eds), Oxford University Press 2010.

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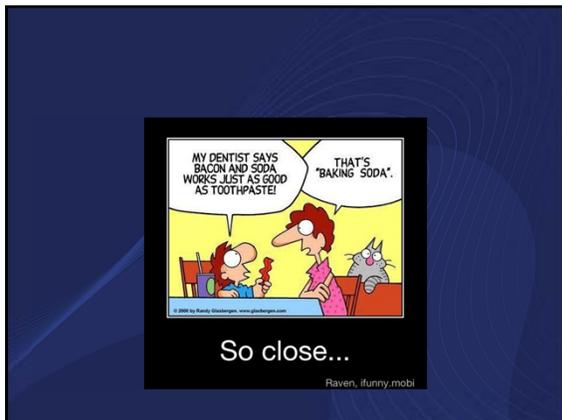
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### Dental hygiene

- Dental care is often neglected in LTC residents.
- One study looked at 260 patients with a mean age of 83.
  - Of those patients 70% had not seen a dentist in more than 5 years
  - Of those wearing dentures, 82% of those patients were unable to clean their dentures
- Upon examination:
  - 19% had "good denture hygiene"
  - 37% had "poor denture hygiene"
- Of patients with teeth, 75% were unable to clean their own teeth

Peltola P, Vehkalahi MM, Wuolijoki-Saaristo K. Oral health and treatment needs of the long-term hospitalised elderly. Gerodontology. 2004;21(2):93-99.

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### Dental hygiene

- Dental health has a significant impact on health
- Difficulty with chewing and therefore increased aspiration risk
- Colonization and proliferation of dangerous pathogens in the oropharyngeal region
  - If aspirated, can lead to pneumonia.

Scarpignato FA, Bush RB, Paju S. Associations between periodontal disease and risk for nosocomial bacterial pneumonia and chronic obstructive pulmonary disease: A systematic review. Ann Periodontol. 2003;8(1):54-69.

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**Dental Hygiene**

- In a Japanese study, 417 elderly patients were randomly assigned to specialized oral care vs. no specialized oral care.
- The specialized oral care group received daily tooth brushing after meals by trained nurses.
  - They also saw dentists/hygienists every week for the duration of the study.
- The no specialized care group did not receive either.

Yoneyama T, Yoshida M, Ohrai T, et al. Oral care reduces pneumonia in older patients in nursing homes. J Am Geriatr Soc. 2002;50(3):430-433.

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**Dental Hygiene**

- Patients assigned to specialized oral care showed significant reduction in pneumonia, febrile days and death compared to the no specialized oral care group.
- The no specialized oral care group had an increased relative risk of 2.45 for developing fever and 1.67 for developing pneumonia.

Yoneyama T, Yoshida M, Ohrai T, et al. Oral care reduces pneumonia in older patients in nursing homes. J Am Geriatr Soc. 2002;50(3):430-433.

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**Dental Hygiene**

- Other studies have shown there to be increased risk for pneumonia in the following settings in the LTC population:
  - 1.2x likely for patients with tooth decay
  - 2.8x likely for patients with a dependency for oral care
  - 4.2x likely for patients with dental plaques
  - 9.6x likely if those plaques happen to be colonized

Scarpignato FA, Bush OR, Paju S. Associations between periodontal disease and risk for nosocomial bacterial pneumonia and chronic obstructive pulmonary disease. A systematic review. Ann Periodontol. 2003;8(1):54-69.

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### Dental hygiene

- Periodontal disease and gingivitis can be another source of bacterial overgrowth
- A periodontal pocket forms between the teeth and the gums in the setting of inflammation and tissue destruction.
- These pockets provide large areas for bacteria to proliferate.
- In patients with 10 or more teeth containing a periodontal pocket, there was a 3.9x increased mortality risk.

Awano S, Ansal T, Takata Y, et al. Oral health and mortality risk from pneumonia in the elderly. J Dent Res. 2008;87(4):334-339.

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### Barriers to Oral Care

- Several factors contribute to sub-par oral care
  - Mouth resistant behaviors by residents
  - Lack of staff education on providing oral care to LTC residents
  - Lack of accountability for providing oral care to LTC residents

Stein P, Aalboe A, Skellon J, Bright BM, Housley M. Meeting oral health challenges in long-term care facilities. Annals of Long-Term Care: Clinical Care and Aging. 2012;20(7):30-34.

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### Managing Mouth Care Resistant Behaviors

- Many behaviors limit providers offering or being able to offer oral care
  - Refusing to open their mouths
  - Biting toothbrushes or fingers inserted in or near the oral cavity.
  - Kicking or hitting providers.
- There is an 8 fold increase in behaviors when cognitive impairment or dementia are existing

Volicer L, Bass EA, Luther SL. Agitation and resistiveness to care are two separate behavioral syndromes of dementia. J Am Med Dir Assoc. 2007;8(8):527-532.

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**Managing Mouth Care Resistant Behaviors**

- Proper communication is essential even when dementia is present.
- Avoidance of "elder-speak"
  - Using fragmented sentences
  - Simple vocabulary
  - Repetition
  - High pitch tone

Jablonski RA. Examining oral health in nursing home residents and overcoming mouth care-resistant behaviors. *Annals of Long-Term Care: Clinical Care and Aging*. 2010;18(1):21-26.

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**Managing Mouth Care Resistant Behaviors**

- Other strategies:
  - Positioning at eye level with the resident
  - Maintaining a friendly disposition
  - Ensuring the resident is as upright as possible
  - Guiding patients with a toothbrush is sometimes enough to get them to be able to successfully brush their own teeth.

Jablonski RA. Examining oral health in nursing home residents and overcoming mouth care-resistant behaviors. *Annals of Long-Term Care: Clinical Care and Aging*. 2010;18(1):21-26.

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**Educating LTC Staff/Addressing Accountability**

- Nursing home staff are often minimally if at all educated on how to provide oral care to their residents or on the importance of providing oral care.
- According to a questionnaire of nursing home caregivers (nursing, MA), a majority:
  - have received no oral care instructions/education
  - Do not accept responsibility for care deferring to the patient's primary dentists.
- In another survey with surveyed physicians, only 33% indicate that they carried out a systematic exam of residents oral cavities.

Ohung JP, Malen P, Biedtz-Jorgensen E. Dental care of elderly in nursing homes: perceptions of managers, nurses, and physicians. *Spec Care Dentist*. 2000;20(1):12-17.

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**Education of LTC staff**

- Education of staff can significantly improve oral care among NH residents.
  - Following an education of NH staff on oral care, gingival bleeding scores and plaque scores were significantly improved.
- In one study, caregivers given a 6 week educational program in oral care had promising results.
  - Reduction in halitosis
  - Reduction in plaque index
  - Increase in caregiver knowledge, behavior and attitudes toward oral care improved

Kullberg C, Sjogren P, Forsell M, Hoopstraten J, Herbst B, Johansson O. Dental hygiene education for nursing staff in a nursing home for older people. J Adv Nurs. 2010;64(3):327-329.  
Park MS, Choi Kwon S. The effects of oral care education on caregivers' knowledge, attitude, & behavior toward oral hygiene for elderly residents in a nursing home [in Korean]. J Korean Acad Nurs. 2011;41(3):484-493.

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**Education of LTC staff**

- It has even been shown that patients on tube feeding need regular oral care.
- Tube feeding in elderly persons is associated with significant pathogenic colonization of the mouth.
  - THESE INDIVIDUALS HAVE WORSE COLONIZATION THAN ORAL FEEDERS.
- Increased risk of aspiration pneumonia.

Melthony NA. Preventing aspiration in older adults with dysphagia. Try this general assessment series. [http://comulgerm.org/uploads/1/1e/1y/1y1u/try\\_this\\_20.pdf](http://comulgerm.org/uploads/1/1e/1y/1y1u/try_this_20.pdf). Published 2012. Accessed July 29, 2014.

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**Education of LTC staff**

- Several programs exist to help educate specific individuals who then become oral care champions at their own facilities.
- The University of Kentucky
  - [www.uky.edu/NursingHomeOralHealth](http://www.uky.edu/NursingHomeOralHealth)
- AMDA
  - Offers a similar health resource for healthcare providers
  - [www.amda.com/tools/clinical/oralhealth.cfm](http://www.amda.com/tools/clinical/oralhealth.cfm)

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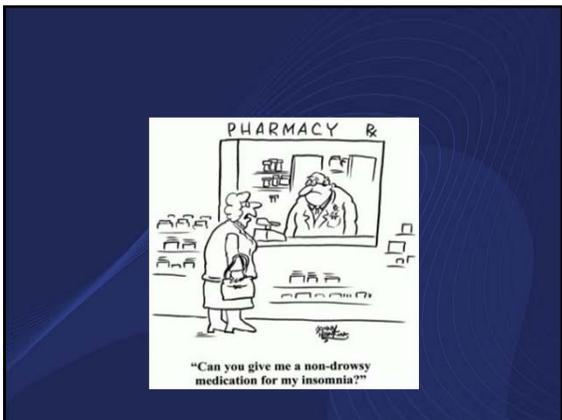
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### Medications and Polypharmacy

- Approximately 95% of older persons take at least one medication.
- 46% of LTC residents take more than nine medications
  - Increased risk of adverse events

Franceschi M, Scarpelli C, Niro V, et al. Prevalence, clinical features and avoidability of adverse drug reactions as cause of admission to a geriatric unit: a prospective study of 1706 patients. *Drug Saf*. 2008; 31(8):545-556.  
Tamura SK, Bell CA, Lehmer K, Jeschke WM, Ziegler LA, Masaki RH. Physician intervention for medication reduction in a nursing home: the polypharmacy outcomes project. *J Am Med Dir Assoc*. 2011;12(5):326-330.

An illustration of a person's head from the neck up, with a large number of colorful pills falling out of their mouth, symbolizing polypharmacy.

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### Medications that Increase the Risk of Aspiration

- Medications can increase the risk via increasing bacterial overgrowth
  - PPI, H2-blockers
- Impairment of swallowing ability
  - Anticholinergic medications
  - Antimuscarinic medications
  - Bisphosphonates
  - Neuroleptics, sedatives, muscle relaxants
- Dry mouth
  - Anti-arrhythmics, antiemetics, anticholinergics, antihistamines, CCB's, decongestants, diuretics, SSRI's.

CT.gov. Medications and dysphagia/swallowing risks. [www.ct.gov/dda/lib/dda/health/attach\\_med\\_dysphagia\\_swallowing\\_risks.pdf](http://www.ct.gov/dda/lib/dda/health/attach_med_dysphagia_swallowing_risks.pdf). Accessed July 31, 2014.

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### Proton pump inhibitors/H-2 blockers

- Recent treatment with a PPI (in the past 30 days) has been shown to have an 3x increased risk of CAP development.
- Other studies have analyzed development of CAP and linked that to H2 blocker and PPI use.
  - PPI users have a relative risk of 1.89 vs. nonusers.
  - H2 users have a relative risk of 1.63 vs. nonusers.
  - Pneumonia development on either medication is 4x that of nonusers

Meijvis SC, Corripio MC, Voorn GP, et al. Microbial evaluation of proton-pump inhibitors and the risk of pneumonia. *Eur Respir J*. 2011;38(3):1165-1172.  
Lahelj RJ, Sturkenboom MC, Hasting RJ, Dieleman J, Stricker BH, Jansen JB. Risk of community-acquired pneumonia and use of gastric acid-suppressive drugs. *JAMA*. 2004;292(16):1955-1960.

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### Potentially Protective Medications

- Early studies have identified low levels of dopamine correlating with motor impairment.
  - Levodopa has preliminarily been identified as a possible solution.
  - Known to significantly improve swallowing dysfunction in patients with Parkinson's disease.

Kobayashi H, Nakagawa T, Sekizawa K, Arai H, Sasaki H. Levodopa and swallowing reflex. *Lancet*. 1996;348(9037):1320-1321.

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### Potentially Protective Medications

- ACE inhibitors
  - In a large retrospective study, post-stroke patients were considered in regards to pneumonia development.
  - Patients taking ACE inhibitors had a 30% reduced pneumonia risk.
  - Why?
    - Enhancement of the cough reflex
    - Reduction in inflammatory cytokine activity
  - Other studies have shown risk reductions of close to 40%.

Liu CL, Shau WY, Wu CS, Lai MS. Angiotensin-converting enzyme inhibitor/angiotensin II receptor blockers and pneumonia risk among stroke patients. *J Hypertens*. 2012;30(11):2223-2229.  
Shinchara Y, Origasa H. Post-stroke pneumonia prevention by angiotensin-converting enzyme inhibitors: results of a meta-analysis of five studies in Asians. *Adv Ther*. 2012;29(10):900-912.

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**Tube Feedings**

- Despite our best efforts, as patients decline and reach the end of their lives, feeding becomes problematic.
- Oral feeding by hand vs. tube feeding
  - Risks of placement of feeding tube in patients with dementia outweigh any benefit from placement.
- Supported recommendation from:
  - American Geriatric Society
  - American Board of Internal Medicine

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**Tube Feedings**

- Long term feeding usually done via PEG tube.
  - Why do a PEG?
    - Perception that it can be:
      - Life prolonging
      - Prevents aspiration
      - Improves malnutrition
      - Alleviates symptoms of hunger or thirst.

Mitchell, SJ, et. al. A cross-national survey of tube feeding decisions in cognitively impaired older person. JAGS 2000; 48:391.

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**Tube Feedings**

- HOWEVER...
  - Large observational studies have proven that all of these are false.
- Survival in patients with advanced dementia is the same for hand fed vs. tube fed patients.
- No increased survival.
- No prevention in aspiration.
- No measurable increase in patient discomfort seen in patients for whom food is withheld.

Teno, JM, et. al. Does feeding tube insertion and its timing improve survival? JAGS 2012; 60:1918.  
Pasman, HR, et. al. Discomfort in nursing home patients with severe dementia in whom artificial nutrition and hydration is forgone. Arch Int Med 2005; 165:1729

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### Tube Feedings

- How do we have conversations surrounding feeding tubes?
- How do we give recommendations?
- What questions should we anticipate?
- How would you answer them?

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### PEG Tube Complication

- Malfunctioning tube
- Restraints to prevent dislodgment
- Increased risk of pressure ulcers
  - One study cites a 2.3 times OR of developing a pressure ulcer in the year following PEG placement.

Glenn, J., et. al. Hospital transfers of nursing home residents with advanced dementia. JAGS 2012; 60:905-910.  
53  
Mitchell, S., et. al. Clinical and organizational factors associated with feeding tube use among nursing home residents with advanced cognitive impairment. JAMA 2002; 287:73.

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### What is our role as a Long Term Care Provider?

- This is an intervention that all LTC providers can be having with their patients and their families.
- Specifically in dementia, it is the role of the LTC provider to understand goals of medical care.

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What is our role in LTC?

- We will watch the following videos showing a family meeting that may not have gone as planned.
- Break into small groups to discuss how we may or how we have handled these meetings previously.
- Then we will show a meeting that does a better job.

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Thank you for your attention!!!

- Questions?
- Email:
  - [John.Liantonio@jefferson.edu](mailto:John.Liantonio@jefferson.edu)

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