

The Art and Science of Dysphagia Management  
in the Geriatric Population

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### Objectives

- Demonstrate a basic understanding of presbyphagia vs. true dysphagia in the elderly
- Understand the leading causes of aspiration pneumonia and how to combat them
- Understand the available evidence regarding modified diets and PEG tubes

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### Key Terms

- Dysphagia-difficulty swallowing
  - Oral
  - Pharyngeal
  - Esophageal
- Aspiration – food or liquid making its way past the vocal folds, so into the trachea
  - Silent Aspiration – aspirating without a cough response
- Penetration- food or liquid making its way into the larynx but not past the vocal folds
- Pharyngeal residue – food leftover in the throat after the patient swallows



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### Key Terms

- “Modified Diet” – can mean a host of different things including modifications to solid food and liquids.
  - Modified solids
    - Puree
    - Minced and moist/ground/dysphagia mechanically altered
    - Soft and bite sized/dysphagia advanced
    - Regular
  - Modified liquids
    - Spoon thick/pudding thick/ extremely thick
    - Honey thick/moderately thick
    - Nectar thick/mildly thick
    - Slightly thick
- Compensatory Strategy – a maneuver like a chin tuck that can reduce or eliminate penetration/aspiration or residue

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### Key Terms

- MBSS (Modified Barium Swallow Study) or VFSS (Videofluoroscopic Swallow Study - Swallow study done under fluoroscopy of patient eating and drinking various consistencies of barium to assess for aspiration/penetration. This study can also reveal what is physiologically causing aspiration/penetration and pharyngeal residue; performed by Speech Pathologist
- FEES (Fiberoptic Endoscopic Evaluation of Swallowing) – endoscopic evaluation of physiology of the swallow and aspiration/penetration
- Clinical Swallow Evaluation - observation of the patient eating/drinking various consistencies of PO and making judgements re: appropriate diet or need for further evaluation based off this, oral mech exam, and thorough review of history

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### Common causes of dysphagia

- Neurologic impairment including stroke, dementia, Parkinson’s Disease, ALS, TBI, etc.
- Respiratory diseases like COPD
- Intubation
- Head and neck cancer
- Deconditioning
- Aging?

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### Presbyphagia—The research

- 56 subjects with a mean age of 83—no dysphagia complaints
  - Only 16% had what is considered “normal” deglutition
  - 63% demonstrated oral phase abnormalities
  - 25% demonstrated pharyngeal dysfunction
  - 39% demonstrated cricopharyngeal muscle dysfunction
  - 36% showed esophageal abnormalities

Ekberg and Feinberg, 1991

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### Presbyphagia—The Research

- 100 subjects, 60+ years old who lived independently
  - Mean age 73.2
- Potential dysphagia symptoms in this population
  - 21% choking
  - 10% coughing
  - 7% throat clearing
  - \*None related this to eating, though

Alvarenga et al 2018

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### Presbyphagia—The Research

- 100 participants underwent a FEES
  - 39% - pharyngeal residue
    - 39% - “pasty” foods
    - 26% - liquids
    - 13% - solids
  - 9% - laryngeal penetration
  - 6% - pharyngeal saliva stasis
  - 2% - tracheal aspiration
- No correlation between potential dysphagia symptoms—choking, coughing, throat clearing—and FEES findings

Alvarenga et al 2018

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### Presbyphagia—The Research

- 20 “older adults” with a mean age of 78.9
  - Each participant contributed 28 swallows
  - Total of 560 swallows for analysis
- Laryngeal penetration—15% of swallows (75% of participants)
- Aspiration—3% of the swallows (30% of participants)

Butler et al 2009

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### Presbyphagia

- Oral phase
  - Increased oral bolus transit time or increased mastication time
    - d/t sarcopenia/weakness in the tongue, lips, or velum
    - May avoid certain foods because they are too difficult to manage
  - Poor dentition
  - Poor saliva/xerostomia
- Pharyngeal phase
  - “Delayed” swallow initiation
  - Reduced hyolaryngeal excursion
  - Increased aspiration/penetration
  - Increased pharyngeal space due to dropping of larynx
    - Increased pressure required to swallow
    - Increased swallow apnea

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### Presbyphagia

- Esophageal Phase
  - Most vulnerable- as research improves, starting to think it’s more related to co-morbidities than esophageal issues in isolation
  - Longer time to clear (normal is 8 – 20 seconds)
  - Reduced opening of the cricopharyngeal muscle
  - Increase in reflux, dysmotility, achalasia
    - Reduced innervation of the nerves
    - Reduced number and density of striated muscles in proximal esophagus
    - Often secondary to other medical conditions like prolonged GERD, DM, esophageal irritation due to medications

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### Significance of Presbyphagia

- Poor reserve when hospitalized for any medical condition
- Mis-identification of dysphagia after neurologic event
  - Ex—89 yo with pharyngeal residue and laryngeal penetration on swallow study after a CVA
- Can be bothersome to healthy adults (or could be undetected)

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### So when do you treat presbyphagia?

- Bothersome symptoms
- Reduced QOL
- Weight loss
- Repeated pneumonias

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### How do you treat dysphagia?

- Traditional Dysphagia Exercises
- EMST (Expiratory Muscle Strength Training)
- IOPI (Iowa Oral Pressure Instrument)
- Diet modifications and compensatory maneuvers
  - More on diet modifications later
  - Compensatory maneuvers
    - Chin tuck
    - Head turn
    - Double swallow
    - Breath hold
    - Alternating liquids and solids

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### To treat or not to treat?

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| <ul style="list-style-type: none"> <li>• 90 yo—relatively healthy</li> <li>• No pneumonias</li> <li>• Complains of food sticking but is able to wash it down with liquids</li> <li>• Referred because his daughter was concerned</li> <li>• MBSS showed pharyngeal residue partially cleared by liquid wash and laryngeal penetration of thin liquids</li> </ul> | <ul style="list-style-type: none"> <li>• 92 yo—relatively healthy</li> <li>• No pneumonias</li> <li>• Complains of food sticking that he can't get to go down</li> <li>• Is bothered by symptoms</li> <li>• MBSS showed pharyngeal residue that somewhat clears with liquid and 1 instance of trace aspiration that wasn't repeatable</li> </ul> |
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### What causes aspiration pneumonia?

- Landmark study in 1998 (Langmore, et al) → Predictors of Aspiration Pneumonia: How Important Is Dysphagia
- 189 patients in outpatient clinics, inpatient acute care wards, and nursing home care centers (No ICU patients and few surgical patients)
- All patients received the following evaluations
  - Clinical Swallow Evaluation
  - Modified Barium Swallow Study
  - ½ also received a Fiberoptic Endoscopic Evaluation of Swallowing
  - 3 scintigraphy examinations to assess esophageal clearance, gastroesophageal reflux, and pulmonary aspiration of gastric refluxed material

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### Langmore et al continued

- Patients were determined to have aspiration pneumonia in the study only if there was consensus between a Pulmonologist, a Geriatrician, and a Cardiologist that 3 things occurred –
  - Elevated WBC (>12,000)
  - Fever (>100.5)
  - New infiltrate on a chest radiograph
- The data was then analyzed to determine the patient predictors for aspiration pneumonia
- 41 of the 189 patients developed aspiration pneumonia (incidence rate of 21.7%)

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### Predictors of Aspiration Pneumonia

- Dependent for oral care
- Tube fed before pneumonia
- Dependent for feeding
- Number of medications
- Current smoker
- Multiple medical diagnoses
- Number of decayed teeth

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### Predictors of aspiration pneumonia by setting

- Outpatient
    - \* Number of decayed teeth
    - High residue rating with pureed food
    - Presence of other neurologic disease
    - Multiple medical diagnoses
  - Inpatient
    - Number of decayed teeth
    - Dependent for oral care
    - \*Dependency for feeding
  - Nursing Home
    - COPD
    - Dysphagia
    - Increasing age
    - \*Dependency for feeding
- \*Highly significant association

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### Incidence of Pneumonia By Setting

- Outpatient – 9%
  - Inpatient—19%
  - Nursing Home—44%
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- 81% if the patients who were diagnosed with aspiration pneumonia did have dysphagia

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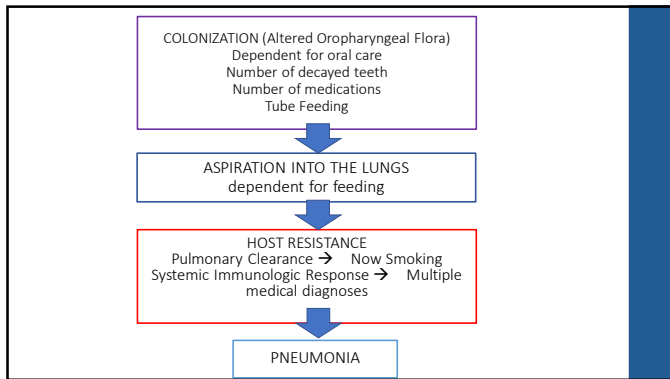
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### Managing aspiration pneumonia risk

- **Dependent for oral care**
  - Be sure that patients and families know how important oral care is
  - If there are memory problems and patients are still doing his own oral care, ensure that family is checking to be sure it's done
  - Electric toothbrushes can be helpful
- **Tube fed before pneumonia**
  - HOB elevated during and 2 hours after TFs
  - Is there going to be a different outcome with TFs vs. oral PO?
- **Dependent for feeding**
  - Occupational therapy consults for adaptive equipment so patients can self feed
  - Caregiver training in how to feed carefully

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### Managing aspiration pneumonia risk

- **Number of medications**
  - Ensure all medications are necessary
  - Avoid medications that can alter mental status
  - Avoid medications that cause xerostomia (increases bacteria in mouth)
- **Current smoker**
  - Education re: quitting in the context of dysphagia
- **Multiple medical diagnoses**
  - Ensure all medical diagnoses are being managed to the best of their ability, especially respiratory diseases
- **Number of decayed teeth**
  - Ensure access to dental care

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### In Summary

- “Aspiration pneumonia is a multifactorial phenomenon and no single predictor can cause this disease. A major conclusion was that dysphagia and aspiration are necessary but not sufficient conditions for development of pneumonia.”

(Langemore et al (1998))

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### Who is going to get pneumonia?

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| <ul style="list-style-type: none"> <li>• 70 yo male with newly diagnosed laryngeal cancer (cancer tx yet to be determined)</li> <li>• Comorbidities: HTN, DM</li> <li>• Functional status: walks independently, no weight loss, is currently still working, teeth in good condition, lives independently</li> <li>• Swallow Function: MBSS showed laryngeal penetration and/or aspiration with all consistencies</li> </ul> | <ul style="list-style-type: none"> <li>• 72 yo male with newly diagnosed laryngeal cancer (cancer tx yet to be determined)</li> <li>• Comorbidities: COPD with current exacerbation requiring current hospitalization</li> <li>• Functional status: walks with assistance, frail, 30 lb. weight loss, rotting teeth</li> <li>• Swallow Function: MBSS showed laryngeal penetration and/or aspiration with all consistencies</li> </ul> |
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### Who is going to get pneumonia?

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|---|--|
| <ul style="list-style-type: none"> <li>• 80 yo male living in CLC</li> <li>• Severe dementia, wheelchair bound</li> <li>• Modified diet x at least 8 years—puree/moderately thick liquids</li> <li>• Coughing, wetness during every meal</li> </ul> | <ul style="list-style-type: none"> <li>• 72 yo male living in CLC</li> <li>• Schizophrenia with medication induced PD and dementia</li> <li>• Significant decline over the last few years</li> <li>• Modified diet secondary to significant coughing with thin liquids—soft and bite sized/mildly thick liquids</li> </ul> |
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### Who is going to get pneumonia?

- 72 yo male with Parkinson's Disease x 10 years
- Comorbidities: MCI
- Functional status: continues to teach karate; has a black belt in karate
- Swallow Function: MBSS showed aspiration of regular liquids but not nectar thick/mildly thick liquids
- 85 yo male with Parkinson's Disease x 15 years
- Comorbidities: COPD; has had 3 pneumonias in the last 3 years
- Functional status: wheelchair bound
- Swallow Function: MBSS showed aspiration of regular liquids but not nectar thick/mildly thick liquids

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### What do we do when we are concerned about development of aspiration pneumonia?

- Modified diets - solids and/or liquids
- Feeding tubes - temporary (NG, dobhoff, etc) vs. long term (PEG, GJ, etc)

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### Modified Diets: The Evidence

- Comprehensive Literature Review in 2014 (with a review of literature between 1985 and 2013)
- Screened a total of 10,147 articles with 488 articles chosen as relevant. A group of 10 expert raters then narrowed this down to 36 articles that met inclusionary criteria.

Murray et al, 2014

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### Results - LIQUIDS

- Clear reduction in the risk of penetration or aspiration with liquids as they become thicker
- Several studies also, though, showed increasing pharyngeal residue as liquids became thicker
- This makes determining a diet's safety difficult as sometimes a thick enough liquid to prevent aspiration may leave a significant amount of pharyngeal residue

Murray et al, 2014

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### Results - SOLIDS

- Lack of evidence to determine the safety of different solid consistencies
  - The only clear evidence is that it takes more masseter surface electromyography signals to ingest solid foods as they become thicker or harder
  - Japanese study found that sticky rice cakes were found to be the leading cause of choking accidents (but jelly cups were also not an infrequent cause of choking)
- Cites a need for universal descriptors so that more research can be done in this area
- Important need as choking can be a cause of death, especially in the elderly population

Murray et al, 2014

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### Clinical Rationale for Solid Diet Modifications

- Hard solids or any solid at all may be too difficult to chew for some people placing them at high risk for choking/airway obstruction
- If there is reduced lingual strength or pharyngeal strength, there may be solid residue leftover in the pharynx
- Chewing can be taxing or difficult for patients who are weak and/or cause difficulty as the meal progresses (ALS, respiratory compromise, etc.)

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### Modified Diets: The Evidence

- Robbins et al (2008) - Comparison of 2 Interventions for Liquid Aspiration on Pneumonia Incidence: A Randomized Trial
- Randomized use of chin tuck, nectar thick liquids, and honey thick liquids in patients with dementia and/or PD
- Patients who performed equally as well or equally poorly with the 3 consistencies on MBSS were randomly assigned to an intervention group
  - Chin down with thin liquids: 259
  - Nectar thick liquids (mildly thick liquids): 133
  - Honey thick liquids (moderately thick liquids): 123
- Patients who were randomized to the chin tuck group were least likely to get pneumonia, then nectar thick liquids, then honey thick liquids
- Patients randomized to chin tuck group were provided with reminders to perform the strategy
- Patients who were in the thickened liquid groups were more likely to be diagnosed with dehydration, UTI, and fever

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### Potential Adverse Effects of Modified Diets

- Poor hydration
- Poor nutrition
- Delayed medication absorption (with increased viscosity of the bolus)
- Impact on QOL
- Caregiver perception (can contribute to non-compliance)
- Cost

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### Limitations of studies assessing modified diets and aspiration pneumonia

- Ethical issues - randomizing high-risk patients to eat a diet he/she is known to aspirate
- Compliance with recommendations
- Lack of standardized terminology, especially for solid consistencies
  - International Dysphagia Diet Standardization Initiative (IDDSI)

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### Incidence of modified diets in Nursing Homes

- Thickened liquids are used in up to 25% of long-term care residents
- 15-30% of long-term care residents and 30-45% of older people in acute and rehabilitation wards receive modified texture food
- Does this fit with the literature?

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### So, what do we do?

- Clinical Expertise
- Incorporate known predictors of aspiration pneumonia
- Multi-disciplinary approach
- Discuss risks and benefits with the patient and/or his family and medical team
- Monitor patient status and have ongoing discussions re: diets

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### Should we modify the diet?

- 69 yo chronically ill patient with many hospitalizations over the last 2 years
- Admitted with a R BKA, bladder mass, chronic malnutrition, chronic pancreatitis, weakness, and chronic pain
  - Poor prognosis but full code per pt's family
- CXR with bilateral pleural effusions with RLL infiltrates
  - Requiring 2 L O2 via NC
  - Overt tracheal/pharyngeal secretions that pt is too weak to cough out
- Clinical Swallow Evaluation—coughing with thin liquids consistently with increased wetness; this is eliminated with nectar/mildly thick liquids

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### Should we modify the diet?

- 69 yo male on inpatient rehab unit who is 2 weeks s/p basal ganglia CVA. Minimal PMH prior to stroke except HTN. Chest X-ray is clear.
- Functional status - prior to stroke he was independent and working. Currently he is requiring assistance for transfers and walking
- MBSS (swallow study) showed laryngeal penetration to the vocal cords with thin liquids. This was eliminated with mildly/nectar thick liquids; however, pharyngeal residue was significantly increased. He also has pharyngeal residue with solids and purees. Thin liquid bolus is able to clear residue but does continue to result in penetration. Nectar thick liquids do not clear the residue but do not result in penetration
- Pt is currently NPO with a dohoff tube because previous swallow study showed significant aspiration with all consistencies.

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### Should we modify the diet?

- 85 yo Nursing Home resident with h/o dementia. He has no lung disease. He has not had a pneumonia in the last 10 years.
- MBSS showed silent aspiration of thin liquids but not of mildly/nectar thick liquids. There was no significant difference in pharyngeal residue between thin and nectar thick liquids.
- His wife reports that he was on thickened liquids while admitted to the hospital one time, and he really hated drinking them.

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### Should we modify the diet?

- 87 yo male who lives at home with his wife
- Dementia, no history of pneumonia
- Wife reports that pt coughs a lot with regular liquids. When he starts to cough, he'll discontinue drinking. She's had a lot of difficulty getting him to drink enough liquids. He's had 3 UTIs over the last 6 months.
- SLP trialed mildly/nectar thick liquids without coughing. While SLP was there pt drank 4 oz of thickened liquids. He endorsed liking the taste.

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## Feeding Tubes

- Feeding tubes do not prevent aspiration
  - Aspiration of secretions
    - Xerostomia = more bacteria?
  - Aspiration of reflux—especially knowing elderly patients have a slower esophagus
- Evidence is based on population, but there isn't research on all populations.
  - Dementia\*
  - ALS
  - Head and Neck Cancer

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## Feeding Tubes in Dementia

- American Geriatrics Society Feeding Tubes in Advanced Dementia Position Statement
- "When eating difficulties arise, feeding tubes are not recommended for older adults with advanced dementia. Careful hand feeding should be offered because hand feeding has been shown to be as good as tube feeding for outcomes of death, aspiration pneumonia, functional status, and comfort."
- As many as 34% of patients with advanced dementia in nursing homes have feeding tubes
- 2/3 of these were placed while patients were in the hospital
- Caregivers report little conversation surrounding this decision with more than half reporting 15 min or fewer spent on the topic

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## Position 1

- Feeding tubes are not recommended for older adults with advanced dementia.
- Use careful hand feeding - at least as good as a feeding tube for outcomes
- Tube feeding is associated with increased agitation, more use of physical and chemical restraints, greater need for medical intervention d/t complications, and increased pressure ulcers

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### Position 2

- Improve oral feeding by modifying the environment and creating patient centered approaches to feeding
  - Pleasure
  - Liberalize diets based on patient preference
  - Eliminate noise and other distractions during meal times
  - Frequent discussions with family and other team members re: plan of care (as it relates to the patient's current stage of dementia)

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### Position 3

- Tube feeding is a medical therapy that can be declined or accepted based off of advance directives, previously stated wishes, or what it is thought the individual would want
- In 1990 the Supreme Court ruled in the Nancy Cruzan case that artificial feeding could be stopped based on a patient's wishes and values

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### Position 4

- It is the responsibility of the entire healthcare team to understand patient's previously stated wishes
  - Initiate these conversations earlier in the disease - can prevent a hurried decision during a hospital admission
  - Respect cultural and religious beliefs and traditions

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### Position 5

- All institutions that care for elderly patients with dementia should promote choice, endorse shared and informed decision-making, and honor individuals' preferences regarding tube feeding
  - Nursing homes should have policies to ensure patients are evaluated and treated appropriately for dysphagia and weight loss and to ensure that tube feeding is not the only treatment choice
  - Decision aids can improve the quality of decision making
  - Geographical and institutional characteristics differences (larger facilities, lack of mid level providers, and for-profit status) have been identified in nursing facilities that use more feeding tubes.
  - Weight loss is a quality measure for US nursing homes and is closely monitored

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### What does "careful hand feeding" look like?

- Set up
  - Patient upright
  - Person feeding patient is within view of the patient (not too far off to the side)
  - Eating setting is as natural as possible
  - Food is appropriate temperature
  - Distractions are limited (TV, noise, clutter, etc)
  - Monitor patient's level of alertness throughout the day and provide food at appropriate times

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### What does "careful hand feeding" look like?

- How to feed
  - Small bites and sips
  - Ensure the patient has fully swallowed before providing another bite or sip
  - Slow rate
  - If the patient sounds "wet or gurgly" try to get him/her to cough or swallow again
  - Ensure food is clearing from the mouth
  - Oral suction can be useful to clear residual food

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## Feeding Tubes in ALS

- Stabilizes weight, combats malnutrition, and is a suitable means for long term nutritional maintenance
- Timing of PEG placement is based on multiple patient factors - FVC, dysphagia symptoms, malnutrition and the condition of the patient
- PEG placement in the later stages of the disease may not be recommended as it can be associated with decreased survival rates

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## Recommendations for Management of Dysphagia in ALS

- Multidisciplinary approach with ongoing assessment
- To ease swallowing difficulties, it is recommended to use modified diets and strategies like the chin tuck
- Ongoing education to patients and caregivers
- Medication and other interventions for drooling can be considered

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## Head and Neck Cancer

- Feeding tubes can be beneficial to improving outcomes during treatment
- There is debate about WHEN to place a feeding tube
- Prophylactically
  - Improve QOL
  - Fewer hospitalizations
  - Better weight preservation
- Reactively
  - Spares patients who may never need a tube
  - Lower rates of chronic dysphagia
  - Shorter duration of tube dependence

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### Should a feeding tube be placed?

- 82 yo male with bipolar disorder, dementia, and medication induced Parkinsonism
- Known aspiration risk but eating a regular diet per discussion with SLP, MD, and pt's brother (medical power of attorney)
  - Dysphagia and drooling noted to be worsening by staff at facility and SLP
  - Correlates with functional decline – non-ambulatory, speech is worse, talking less, more confused
  - Ongoing discussions were being held with all members of the team
- Hospitalized for his 1st pneumonia in several years. Treated without ICU stay or intubation
- MBSS performed by an SLP who is not familiar with him with recommendations for NPO d/t aspiration or penetration across most consistencies

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### Should a feeding tube be placed?

- 65 yo male with h/o DJD/DISH with extensive ACDF with resultant dysphagia
- Works full time, independent
- Significant dysphagia is confounded by anxiety
- MBSS showed significant pharyngeal residue d/t narrowing of the pharynx and laryngeal penetration of thin liquids
- Significant stress/anxiety around eating and reduced QOL trying to get enough PO

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### Should a feeding tube be placed?

- 76 yo male
- Admitted with COPD exacerbation and SOB
- Found to have significant laryngeal/pharyngeal mass
- MBSS showed significant risk of aspiration with all PO, safest was soft diet with honey thick liquids; however, given pharyngeal residue he may aspirate this
- Aspiration of oral secretions on scope by ENT
- Homeless, possible cognitive impairments, no medical POA, questions surrounding capacity

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