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.

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.
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

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

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!!!!!!!
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...

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.


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


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**


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.

- 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.
Aspiration pneumonia (with bacteria)
- Slow insidious onset
- Gradual worsening of symptoms over 72 hours
- Fever, elevated WBC
- Responds to antibiotics

Chemical Pneumonitis
- Recovers within 24-36 hours
- Can occur with or without a bacterial infection
- Prominent dyspnea at onset of symptoms
- Severe rapid hypoxemia followed by relatively quick recovery with pulmonary supportive care

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Algorithm for how to treat aspiration

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%)

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
Treatment for aspiration pneumonia

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

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

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 affected.
- 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

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.


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 affecting the nasopharyngeal tract
  - Achalasia


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.

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.


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

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.
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


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


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.

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.

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.

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, J. Evaluation and Treatment of Swallowing Disorders (p. 198), Austin, TX, 1998.
Food texture and viscosity

- **Pureed diet:**
  - Blended/soft 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.

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.

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.
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.


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.

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.


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 2.43 for developing fever and 1.67 for developing pneumonia.


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

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.


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


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

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


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.


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.

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


- 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.


- 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
  - AMDA
    - Offers a similar health resource for healthcare providers
    - www.amda.com/tools/clinical/oralhealth.cfm
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


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-arrythmics, antiemetics, anticholinergics, antihistamines, CCB’s, decongestants, diuretics, SSRI’s.

Proton pump inhibitors/H-2 blockers

- Recent treatment with a PPI (in the past 30 days) has been shown to have a 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.


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.


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%.

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

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.

• 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

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.
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?

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.

Givens, JL, et. al. Hospital transfers of nursing home residents with advanced dementia. JAGS 2012; 60:905.


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.
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.

Thank you for your attention!!!

Questions?

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