



FEES ADVOCACY



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Fiberoptic Endoscopic Evaluation of Swallowing (FEES) has emerged as an invaluable diagnostic tool, revolutionizing the assessment and management of swallowing disorders. This non-invasive procedure involves the insertion of a flexible endoscope through the nasal passage to directly visualize the structures and functions involved in swallowing. The advantages of FEES extend beyond its diagnostic capabilities, offering unique insights and contributing to improved patient care and lower costs for that care for facilities that utilize FEES. This document aims to underscore the necessity and importance of FEES in clinical practice.



BENEFITS OF FEES

- **Accuracy and Precision:** FEES offers superior image resolution and magnification compared to other methods, enabling precise identification of anatomical abnormalities and functional impairments (Leder, 2015).
- **Dynamic Evaluation:** Unlike static imaging techniques, FEES allows clinicians to observe the dynamic movement of swallowing in real-time, providing valuable insights into the coordination and timing of the swallowing process (Kelly, Huckabee, & Jones, 2018). FEES also utilizes real foods and liquids, allowing for testing of favorite foods or foods that are particularly difficult for a patient.
- **Accessibility:** FEES can be performed at the bedside, making it accessible to a wider range of patients, including those who may be medically unstable or have physical limitations that impede participation in fluoroscopy in the radiology suite for alternative assessments (Langmore et al., 2012). Bedside evaluations also facilitate the assessment of patients in various positions, allowing for a more comprehensive understanding of their swallowing function.



BENEFITS OF FEES

- **Reduced Radiation Exposure:** FEES eliminates the need for exposing patients to radiation, a concern particularly in vulnerable populations such as pediatric and elderly patients. This enhances patient safety and reduces potential long-term health risks associated with repeated exposure (Giraldo-Cadavid et al., 2016).
- **Therapeutic Guidance:** FEES allows for the direct observation of aspiration and penetration events, enabling therapists to tailor rehabilitation strategies to address specific impairments and monitor progress over time (Kelly et al., 2018). FEES also allows for reproducible assessments, enabling clinicians to monitor changes in swallowing function over time. This capability is particularly valuable for tracking progress during rehabilitation and adjusting treatment plans accordingly (Leder, 2015). The ability to perform repeated assessments contributes to a more comprehensive understanding of the dynamic nature of swallowing disorders.



INDICATIONS FOR FEES

Patient Populations that may benefit from FEES (Langmore et al., 2022)

- Neurodegenerative disease (e.g., amyotrophic lateral sclerosis and Parkinson's disease)
- Spinal cord injury
- Neurological injury (e.g., cerebrovascular accident or traumatic brain injury)
- Head and neck cancer (e.g., surgery, radiation therapy, and/or chemotherapy)
- Known or suspected cranial nerve injury caused by disease or surgery (e.g., high vagal nerve injury, recurrent laryngeal nerve injury, and superior laryngeal nerve injury)
- Tracheostomy
- Mechanical ventilation or other respiratory issues (e.g., chronic obstructive pulmonary disease)
- Post extubation status
- Medical fragility



INDICATIONS FOR FEES

Clinical Indications for Use of FEES (Langmore et al., 2022)

- Symptoms of pharyngeal dysphagia or observed signs of pharyngeal dysphagia
- Abnormal vocal quality and suspected dysphagia Odynophagia (pain with swallowing) Increased difficulties with swallowing over the duration of a meal, secondary to fatigue hypernasality and suspected nasal regurgitation
- Suspected or observed difficulty swallowing saliva/oral secretions
- Observe and assess laryngeal function related to laryngeal competence and airway protection
- Visualization of the hypopharynx/larynx with ample time for biofeedback education and/or to teach a specific exercise or maneuver
- Test patient using real food
- Monitor progress and need for any current dietary or postural restrictions
Limit or elimination of radiation exposure
- Overcome the difficulty transporting patients to and/or positioning patients in the radiology suite (e.g., bedridden or patients who are weak; patients with open wounds, contractures, or pain; patients who are quadriplegic or wearing a halo; patients who are obese or present positioning difficulties; patients on intensive care unit monitors or ventilators; and patients in isolation units)



INCIDENTAL FINDINGS

Studies have reported frequent incidental findings during FEES examinations. In a comprehensive investigation by Kelly et al. (2015) and a separate study by Pazak et al. (2021), incidental findings were identified in approximately 39% of cases in both studies, ranging from vocal fold immobility, fungal infections, edema, erythema, granuloma, and cancer among others. While the purpose of FEES is not to look for abnormalities in nasal, laryngeal, pharyngeal, and tracheal anatomy, these findings often result in consultations to otolaryngology and increase overall patient care and outcomes.



INCREASED HOSPITAL COSTS AND LENGTH OF STAY (LOS)

Dysphagia imposes significant financial burdens on healthcare systems due to increased costs and prolonged hospital stays (Cabre et al., 2016). A systematic review examining the impact of oropharyngeal dysphagia on healthcare costs and length of hospital stay found compelling evidence linking dysphagia to higher healthcare expenditures and extended hospitalizations (Steele et al., 2017). The presence of dysphagia increased hospital costs by 40-60% and LOS by an average of 4 days, with the cost directly attributed to dysphagia to be \$12,715 USD (Allen et al., 2019; Attrill et al., 2018). Additionally, patients with dysphagia are more likely to be discharged to a post-acute care facility, further increasing healthcare costs (Patel et al., 2018). By having access to FEES, early detection of dysphagia can be achieved and targeted interventions can be initiated quickly to reduce costs and LOS and more importantly, improve patient outcomes. Rehospitalization rates among patients with dysphagia can also be reduced through the use of FEES, easing the financial, emotional, and physical burden for at-risk patients (Molfenter et al., 2018).



FEES IN THE LONG-TERM CARE SETTING

Dysphagia evaluation in the long-term care setting can be particularly difficult as there is no immediate access to radiology. Many patients receive imaging while in the acute care setting and the diet recommendations made there follow them after discharge. These recommendations may no longer be appropriate or needed as the patient is no longer acutely ill and repeat imaging is necessary (Bice et al., 2024). A study by Bice et al. (2024) found that following a FEES completed in the long-term care setting, only 4% of patients with feeding tubes were recommended to continue alternative feeding and only 33% of patients had dysphagia. These patients were receiving unnecessary therapy, modified diets, and alternative feeding, all increasing the costs of their care. If these patients had received a FEES earlier in admission to long-term care, these unnecessary costs could have been avoided.



THE COSTS OF MODIFIED DIETS

Modified diets are often used as a treatment for dysphagia. These include thickening liquids, preparing solids in different ways including pureeing all foods, and providing non-oral means of nutrition, most often with feeding tubes. All of the modifications come at a cost both financially, but also to the patient's overall health and quality of life. Financially, the estimated yearly cost of providing 1 year of feeding via a PEG tube is over \$30,000 USD (Callahan et al., 2001). The yearly cost of thickened liquids can vary based on brand and type of thickener but is estimated to be between \$1,000 USD and \$5,000 USD. Physically, use of modified diets can result in decreased intake resulting in malnutrition and dehydration. Malnutrition and dehydration are a contributing factor to many of the most common reasons for readmission to the hospital (Bice et al., 2024). There is also no current evidence that modified diets reduce the risk of pneumonia (O'Keefe, 2018). In terms of quality of life, modified diets have a significantly negative impact. In a survey, 84% of patients on modified diets reported eating should be an enjoyable experience, however, only 45% of those felt that it was (Ekberg et al., 2002). With timely intervention with FEES, these costs can be reduced or avoided all together.



COST/BENEFIT ANALYSIS EXAMPLE 1



FEES vs MBSS vs No Instrumental Evaluation Cost Comparison

Wait time for Instrumental Evaluation Days

	FEES	MBSS
	5	45

Yearly cost of dysphagia (not including rehospitalization) if no instrumental examination is completed \$11,340.50

Current Daily Dysphagia cost

Thickened liquids	\$7.70	\$7.70
Modified diet/solids (including dietary supplements)	\$2.00	\$2.00
Tube Feed Formula	\$0.00	\$0.00
Feeding tube maintenance and supplies	\$0.00	\$0.00
Daily total	\$9.70	\$9.70
Weekly total	\$67.90	\$67.90
Monthly total	\$291.00	\$291.00
Total before instrumental evaluation can be completed	\$48.50	\$436.50

Cost of Dysphagia Therapy**

Cost per day for therapy session/SLP Wage	\$50.00	\$50.00
Number of therapy sessions per week	3	3
Total before instrumental evaluation can be completed	\$83.33	\$750.00

**Note: Dysphagia therapy may or may not be needed. This is a calculation to determine how much may be spent on therapy if it is determined that the patient does not have dysphagia.

Cost of Instrumental Swallow Evaluation

	FEES	MBSS
Fee for examination (minus reimbursement as applicable)	\$400.00	\$1,200.00
SLP Wage	\$0.00	\$0.00
Radiologist Wage	\$0.00	\$0.00
Radiology Tech Wage	\$0.00	\$0.00
Nurse Wage	\$0.00	\$0.00
Patient Care Tech Wage	\$0.00	\$150.00
Transportation	\$0.00	\$200.00
Cleaning supplies/infection control	\$0.00	\$0.00
Food trials and other trial materials	\$0.00	\$0.00
Total Cost	\$400.00	\$1,550.00



COST/BENEFIT ANALYSIS EXAMPLE 2



FEES vs MBSS vs No Instrumental Evaluation Cost Comparison

Wait time for Instrumental Evaluation	Days

Current Daily Dysphagia cost

	FEES	MBSS
Thickened liquids	\$0.00	\$0.00
Modified diet/solids (including dietary supplements)	\$0.00	\$0.00
Feeding tube formula, maintenance, and supplies	\$87.21	\$87.21
Daily total	\$87.21	\$87.21
Weekly total	\$610.47	\$610.47
Monthly total	\$2,616.30	\$2,616.30
Total before instrumental evaluation can be completed	\$436.05	\$3,924.45

Cost of Dysphagia Therapy**

	FEES	MBSS
Cost per day for therapy session/SLP Wage	\$50.00	\$50.00
Number of therapy sessions per week	3	3
Total before instrumental evaluation can be completed	\$83.33	\$750.00

Cost of Instrumental Swallow Evaluation

	FEES	MBSS
Fee for examination (minus reimbursement as applicable)	\$400.00	\$1,200.00
SLP Wage	\$0.00	\$0.00
Radiologist Wage	\$0.00	\$0.00
Radiology Tech Wage	\$0.00	\$0.00
Nurse Wage	\$0.00	\$0.00
Patient Care Tech Wage	\$0.00	\$150.00
Transportation	\$0.00	\$200.00
Cleaning supplies/infection control	\$0.00	\$0.00
Food trials and other trial materials	\$0.00	\$0.00
Total Cost	\$400.00	\$1,550.00

Yearly cost of dysphagia (not including rehospitalization) if no instrumental examination is completed \$39,631.65

**Note: Dysphagia therapy may or may not be needed. This is a calculation to determine how much may be spent on therapy if it is determined that the patient does not have dysphagia.



CONCLUSION

Fiberoptic Endoscopic Evaluation of Swallowing (FEES) emerges as a pivotal diagnostic tool in the assessment and management of swallowing disorders, offering unparalleled benefits in accuracy, accessibility, reduced radiation exposure, therapeutic guidance, and dynamic evaluation. The incidental findings during FEES underscore its role in comprehensive patient care, leading to timely consultations and improved outcomes. Moreover, by facilitating early detection and targeted interventions, FEES holds the potential to mitigate the financial burdens associated with dysphagia, including increased hospital costs, prolonged length of stay, and unnecessary treatments like modified diets. The integration of FEES into clinical practice, particularly in long-term care settings, not only optimizes resource allocation but also enhances the quality of life for patients, emphasizing its indispensability in modern healthcare paradigms. Therefore, the widespread adoption of FEES represents a pivotal step towards achieving cost-effective and patient-centered care in the management of swallowing disorders.



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