

# Pediatrics<sup>in</sup>Review<sup>®</sup>

## **Focus on Diagnosis : Dysphagia**

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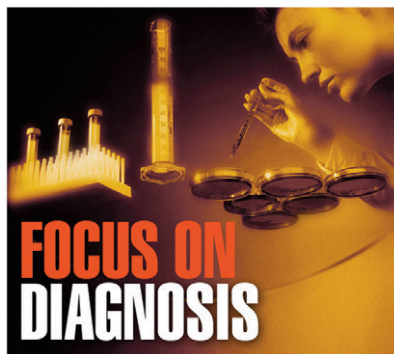
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## Dysphagia

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### Introduction

Dysphagia, or difficulty with swallowing, may present alone or with accompanying signs and symptoms. The evaluation of dysphagia is guided by an accurate and thorough history, taken in consideration of the vast differential diagnosis. A brief review of the physiology of swallowing is followed by a differential diagnosis and historical points that should direct the diagnostic evaluation. Finally, a review of diagnostic and treatment options is presented.

### Physiology of Swallowing

Swallowing prepares and transfers a bolus of consumed or secreted substance from the mouth to the stomach. Initially, the pooling of oral secretions forms a bolus, with or without masticated food. This bolus is then transferred to the upper esophagus during the oropharyngeal phase of swallowing. During this phase, the epiglottis covers the larynx to prevent aspiration of the bolus. Additionally, the soft palate is elevated against the nasopharynx to prevent nasal regurgitation of the bolus. Transfer of the bolus to the stomach then occurs through peristaltic muscle contractions of the circular and longitudinal smooth muscles of the esophagus and relaxation of the lower esophageal sphincter. The developmental milestone of swallowing typically is reached at 34 weeks gestational age in premature infants.

### Differential Diagnosis

It is best to separate oropharyngeal from esophageal causes when

considering the differential diagnosis of dysphagia. Oropharyngeal causes, in general, are grouped as neuromuscular, infectious/inflammatory, or structural (Table 1). Esophageal causes are divided into structural causes, dysfunctions of motility, and mucosal disorders (Table 2).

### History and Physical Examination

The importance of a thorough and accurate history cannot be overstated. In adults presenting with dysphagia, the likely diagnosis may be uncovered while obtaining a history in approximately 75% of patients. (1) Adolescents may provide an accurate history; however, infants may present with nonspecific feeding symptoms such as poor interest, neck muscle strain, or stridor. Drooling between meals also may be present. Initially, an assessment of airway patency and respiratory effort is necessary. At this time, considerations should be made for conditions requiring urgent treatment, including foreign body aspiration, caustic ingestion, epiglottitis, myasthenia gravis, tetanus, and diphtheria. Next, the focus should be on distinguishing between oropharyngeal and esophageal causes.

### Oropharyngeal Causes

In general, oropharyngeal causes of dysphagia are indicated by delayed swallow initiation, postnasal regurgitation during swallow, cough with swallow, drooling, or persistent throat clearance. Owing to referred viscerosomatic sensation, neck symptoms do not indicate oropharyngeal rather than esophageal origins. When structural lesions are not readily apparent,

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Table 1. Oropharyngeal Causes of Dysphagia

Neuromuscular Causes	Infectious/Inflammatory Causes	Structural Causes
Amyloidosis	Botulism	Cleft lip
Brain tumor	Coxsackievirus	Cleft palate
Cerebral palsy	Cytomegalovirus	Congenital esophageal web
Cerebrovascular accident	Diphtheria	Goiter
Dystonic reaction	Epiglottitis	Lymphadenopathy erythematous
Guillain-Barré syndrome	Encephalitis	Tetanus
Multiple sclerosis	Herpes simplex virus	
Myasthenia gravis	Juvenile dermatomyositis	
Sarcoidosis	Neurosyphilis	
Systemic lupus	Peritonsillar abscess	
	Polio	
	Retropharyngeal abscess	

one may proceed to evaluation for neuromuscular or infectious/inflammatory disorders.

The nature of the onset of symptoms may help to refine further the differential diagnosis. Sudden onset generally indicates neurologic dysfunction, possibly due to a cerebrovascular accident in populations at risk. Subacute onset can be seen with infectious or autoimmune causes. Although rare, progressive onset may indicate external mass effect. Persistent, nonprogressive symptoms can suggest static neurologic dysfunction due to cerebral palsy or subtle structural abnormalities such as cleft palate or choanal atresia.

Systemic signs and symptoms may provide the astute clinician with

further clues. Feeding refusal with oral mucosal lesions and an otherwise reassuring examination may indicate coxsackievirus, herpes simplex virus, or cytomegalovirus. Fevers in the context of oropharyngeal dysphagia may indicate retropharyngeal or peritonsillar abscess. Encephalitis and neurosyphilis also are considerations when the patient demonstrates focal neurologic findings, seizures, or altered mental status. Any neurologic process affecting bulbar function may cause swallowing dysfunction. Botulism or myasthenia gravis will present with diffuse weakness. Drug-induced dyskinesia will be indicated by other extrapyramidal effects. Finally, rash may be expected

with a rare cause of dysphagia, juvenile dermatomyositis.

### Esophageal Causes

Esophageal causes of dysphagia present with retrosternal chest pain or “sticking” sensations with swallowing. The presence of symptoms when swallowing both solids and liquids indicates motility dysfunction. Examples of motility dysfunction include achalasia (failure of the lower esophageal sphincter to relax) or diffuse esophageal spasm, both rare. Difficulty swallowing solid materials only indicates an obstructive process. Obstructive processes can be intrinsic to the esophagus, such as stricture caused by chronic inflammation associated

Table 2. Esophageal Causes of Dysphagia

Motility Disorders	Structural	Esophagitis
Achalasia	Intrinsic	<i>Candida</i> infection
Diffuse esophageal spasm	Esophageal web	Caustic ingestion
Scleroderma	Zenker diverticulum	Chlamydia infection
	Stricture	Crohn disease
	Extrinsic	Eosinophilic esophagitis
	Foreign body	Gastroesophageal reflux disease
	Mediastinal mass	Herpes simplex virus
	Pulmonary sling	Pill esophagitis
	Vascular ring	

with gastroesophageal reflux disease, Crohn disease, or eosinophilic esophagitis. Mediastinal masses, vascular rings, and pulmonary slings cause obstruction from outside the esophagus.

Finally, pain generally indicates esophagitis. Infectious esophagitis is usually caused by *Candida*, or, less frequently, herpes simplex virus or cytomegalovirus, and should prompt immunodeficiency evaluation and human immunodeficiency virus infection screening. Intermittent pain following meals may indicate gastroesophageal reflux disease, and pain in male teens also should prompt consideration of eosinophilic esophagitis. Finally, it is important to remember that 20% to 40% of those with Crohn disease experience esophageal involvement.

### Diagnostic Evaluation

Laboratory evaluation of the child presenting with dysphagia should proceed according to findings on the history and physical examination. Several radiologic and procedural techniques for evaluation are available although extensive workup may not be necessary to arrive at the correct diagnosis.

Videofluoroscopic barium studies involve the administration of contrast for the radiographic observation of swallowing. A barium swallow study observes the oropharyngeal phase of swallowing. This test is done with the collaboration of a speech and language therapist who may tailor treatments with the use of results from this study. Liquids, semisolids, and solid foods are tested. In addition to observing bolus handling through the oropharyngeal swallow, the study may reveal aspiration. A drawback to this test is the use of radiation directed at the head. In addition to permitting observation of the esophageal phase of swallowing, barium esophagography evaluates for

extraesophageal causes of dysphagia, which may be missed by endoscopy.

Fiberoptic endoscopic evaluation of swallow with or without sensory testing involves the passage of a flexible endoscope through a nostril to observe pharyngeal soft tissue structures directly, immediately before and after swallowing. The procedure may detect laryngeal penetration of the food bolus as well as incomplete clearance. Sensory testing involves the use of a puff of air to stimulate the laryngeal adductor reflex, which is responsible for the airway protection response. Limitations include the need for technical expertise and the possibility of patient intolerance.

Upper endoscopy is used to observe the esophageal mucosal appearance directly and obtain tissue biopsies when indicated. This test may detect and differentiate among causes of esophagitis. Also, endoscopy may reveal remnant food particles, indicating the possibility of dysmotility. Sedation is necessary for this procedure.

Esophageal manometry measures esophageal pressures and pressure changes during swallowing. Manometry involves passage of a catheter with pressure sensors along its length. This study is used to evaluate for motility disorders.

### Treatment

The treatment of dysphagia depends on its cause and severity. With severe cases or in those patients with excessive salivary excretion, medical or surgical management of secretions may be necessary. A treatment plan is determined best by a multidisciplinary team, including a dietician, behavioral psychologist, speech and language pathologist, occupational therapist, and physician. Nutritional goals should be set immediately for all patients. In some cases, maintaining nutrition will require temporary or permanent

feeding tube placement. If possible, swallowing rehabilitation is attempted by using texture modification, strengthening exercises, and rate control. The risk of aspiration must be taken into consideration for all patients.

## Summary

- The evaluation of the child with dysphagia requires a basic understanding of the swallowing mechanism, a detailed history, and thoughtful consideration of the differential diagnosis. Further testing will be well guided by this approach.
- Treatment is diagnosis-specific but should take into consideration the management of oral secretions, potential for aspiration, and nutritional needs.

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