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# Effects of Myasthenia Gravis on Voice, Speech, and Swallowing

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# Effects of MG on Voice and Speech

## Background

Dysphonia (voice disorder) is relatively common in the general population, occurring in about a third of all people at some point in their lifetime but occurs in only about 2% of persons with MG. Dysarthria (slurred speech) is less common in the general population, but occurs in over 10% of people with myasthenia gravis. Difficulty voicing or speaking can affect job performance, and may cause a person to feel socially isolated because they have a hard time being understood or heard.

The human voice is produced by generating air pressure in the lungs. It flows through the vocal folds (vocal cords), causing them to vibrate and produce sound. Symmetric and fluid vibration of the vocal folds creates a pleasing, smooth voice. Human speech is produced by using the muscles of the throat, jaw, palate, tongue, and lips to shape the sound generated by the voice box into consonants and vowels. When the muscles of the lungs, vocal tract, throat or mouth are affected in MG, we may see symptoms of voice, speech, and swallowing problems.

Voice problems seen in MG include vocal fatigue (voice wears out over the day or with prolonged speaking tasks), difficulty controlling pitch, or a monotone voice (lack of ability to change vocal pitch). The voice problem can stem from poor breath support

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or from weakness causing the vocal folds not to move properly. Speech disturbances include a hypernasal voice or slurred speech (dysarthria). Dysarthria is more frequently seen in younger patients diagnosed with MG, whereas dysphonia is more often seen in elderly men with MG. Typically, the symptoms appear and/or worsen with continuing or extended speech.

## Diagnosis

The diagnosis of dysphonia or dysarthria is often very apparent to a person with MG because they perceive a change in their voice or speech production. Sometimes, the symptoms may be subtle or intermittent, and the diagnosis is made by a speech-language pathologist or a medical doctor. Since dysarthria is a common symptom of stroke, any new onset of dysarthria should be immediately evaluated by a medical professional. Any person with vocal disturbance lasting more than 2 weeks should seek medical attention in a timely manner.

If you are experiencing a voice disorder, you may be referred to an ear, nose, and throat (ENT) physician to be sure that the dysphonia is due to MG and not another cause. The ENT physician will usually perform a laryngoscopy. This is a relatively straightforward examination that uses a small flexible camera inserted through the nose to visualize the upper airway. It is done with local anesthesia in the office setting and only takes a few minutes to complete.

## Treatment

The treatment of speech and voice disorders in MG is individualized and based on the underlying cause and severity of the problem. Pharmacological therapies used for other symptoms of MG are typically utilized. Other treatments may involve therapy with a speech-language pathologist. Strengthening exercises and/or compensatory strategies may be employed

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to help increase understandability. A strengthening program is not indicated during a myasthenic crisis or exacerbation, but may be implemented during stability or when in remission. Exercises should be performed during peak drug therapy. Always review any plan of care with your MG treating provider.

Improvement and prognosis of voice and speech is often related to the treatment of overall MG disease. Research will continue to play an important role in answering questions and developing new treatments for dysphonia and dysarthria in individuals with MG.

## Effects of MG on Swallowing

### Background

Swallowing difficulty (dysphagia) is common in individuals with MG. Swallowing is a complex process involving approximately 50 pairs of muscles. Coordinated and effective swallowing is necessary to prevent food from entering the airway (aspiration). The impact of MG on swallowing may occur gradually or suddenly. Swallowing muscles may become fatigued, particularly toward the end of a meal or when foods require a lot of chewing. Persons with thymomas are more likely to have difficulty with muscles of the face and neck at the time of MG diagnosis, which can cause dysphagia.

Swallowing occurs in three "phases." During the oral (mouth) phase, food and liquid are taken into the mouth, chewing occurs if needed, and then the food and liquid are transferred back to the throat. During the pharyngeal (throat) phase, the food and liquid are transferred from the throat to the esophagus. The esophageal phase consists of food and liquid being transferred from the esophagus to the stomach.

### Assessment

If you are experiencing swallowing problems, your physician may refer you to a speech-language pathologist to examine how the muscles of the face and throat are working. You may be asked to eat and/or drink foods of various consistencies during this initial evaluation. If the speech-language pathologist believes that further testing is needed, you may have

either a modified barium swallow (MBS) study or a flexible endoscopic evaluation of swallowing (FEES). The MBS study uses a continuous X-ray with barium added to food to take pictures while you eat and drink. FEES uses a flexible endoscope (as described for the laryngoscopy procedure above) to visualize your throat while you eat and drink. During these examinations, you may be asked to try various positions or maneuvers (such as touching your chin to your chest when you swallow) to see if this helps you swallow more safely.

## Treatment

Treatment for dysphagia is individualized and based on the underlying cause and severity of the swallowing problem. In addition to pharmacological therapy for MG, smaller, more frequent meals can help with reducing fatigue, particularly when solids are soft and do not require a lot of chewing. Resting prior to eating and avoiding talking while eating may also help reduce fatigue. Other strategies that have been reported to help when eating and drinking is to consume cold foods and liquids, as well as to alternate a small bite of solid food with a small sip of a liquid. Additionally, the speech pathologist may recommend you drink thicker liquids, which may be safer to swallow than thin liquids. Commercial products are available to thicken thin liquids.

Another strategy is to time meals around the peak of your medication (eating about an hour after taking Mestinon/pyridostigmine, for instance, intended to improve muscle function). For individuals who have difficulty with swallowing pills, crushing a medication or placing them in pudding/applesauce can help. Some medications may also come in liquid form or dissolvable gel caps. Seek advice from a pharmacist regarding options for taking medications.

If it is determined that it is not safe to eat or drink by mouth, a feeding tube may be needed. A tube can be inserted through the nose and into the stomach, or a more permanent tube may be placed directly through the skin of the abdomen into the stomach. A feeding tube may be used as a primary means of nutrition (where no food or liquid is taken in by mouth) or as a supplemental means of nutrition (where some food and/or liquid is consumed by mouth).

An active swallowing strengthening program is not indicated during a myasthenic crisis or exacerbation, but may be implemented during stability or when in remission. If swallowing exercises are recommended, the exercises should be performed during peak drug therapy and should not be performed immediately prior to eating.

## Prognosis

In persons with MG, dysphagia may persist when other clinical symptoms have improved. In individuals with swallowing problems during the pharyngeal phase, prognosis tends to be poorer. Any concerns related to swallowing should be discussed with your medical doctor. Research will continue to play an important in role in answering questions and developing new treatments for dysphagia in individuals with MG.

If choking occurs, apply emergency principles as outlined by the American Heart Association to relieve choking (Heimlich maneuver).

**Myasthenia gravis (MG)** is a chronic autoimmune neuromuscular disease characterized by varying degrees of weakness of the skeletal (voluntary) muscles of the body. MG may affect any voluntary muscle, including the muscles we use to speak and swallow.

**Dysphonia** is a broad term used to describe a voice disturbance. Many people compare dysphonia with hoarseness. However, it is more appropriately described as any undesirable change in vocal quality. Dysphonia can be caused by many different disease entities.

**Dysarthria** is a problem with articulation, or a problem with how speech sounds are pronounced. Dysarthria is often characterized as "slurred speech." It can be caused by incoordination or muscle weakness. When the muscles of the tongue, lips, palate, voice box or jaw do not function properly, they cannot form precise sounds.

**Dysphagia** is the medical term for the symptom of swallowing difficulty. Some common symptoms of dysphagia include feeling of something "stuck" in the throat, drooling, food residue in mouth, gagging, coughing/choking, unintentional weight loss, difficulty chewing, or "wet" voice after swallowing. People with dysphagia often avoid food items they once enjoyed. A serious complication of dysphagia is aspiration pneumonia (a serious lung inflammation resulting from food particles in the lung).

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**The MGFA mission is to facilitate the timely diagnosis and optimal care of individuals affected by myasthenia gravis and closely related disorders and to improve their lives through programs of patient services, public information, medical research, professional education, advocacy and patient care.**

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