Swallowing Problems (Dysphagia)

Adults swallow about 2400 times a day. We swallow many times during every meal, and regularly throughout the day and night to clear saliva from our mouths. We do it so automatically that most people never think about how it happens. It is, in fact, a complex series of movements. Five or six major central nervous system nerves and about 23 muscles are involved in swallowing. This is why people with medical conditions like ALS, which affect the nerves or muscles of the face and neck, have swallowing problems. Swallowing can be disrupted if the muscles of the mouth or throat are weak or uncoordinated. Difficulty in swallowing is known as dysphagia (diS-FAY-juh).

Many ALS patients suffer from dysphagia or difficulty in chewing or swallowing. Signs of dysphagia include choking on foods or liquids, drooling, trouble swallowing medications, increased length of mealtimes, a wet gurgling sound to the voice, coughing and frequent clearing of the throat, weight loss, need for the Heimlich maneuver, or pneumonia. Complications can be severe and include aspiration pneumonia, dehydration, malnutrition, weight loss and increased muscle wasting due to decreased calorie and protein intake. If you are experiencing any of these symptoms it is important that you discuss these with your physician. A referral can be made for an evaluation by a speech pathologist and dietician. The dietician and speech pathologist can work with you to learn techniques to make swallowing easier, safer and keep you eating by mouth longer.

The Swallowing Process

Swallowing occurs in the oral cavity, pharynx, and the esophagus. Below is a cross-sectional view of the head and neck showing the structures and muscles that are used during the swallowing process.

![Swallowing Process Diagram]

The purpose of swallowing is to get food from the mouth, through the throat (pharynx), to the stomach, without allowing it to come out the nose or go down the windpipe (trachea). The throat is essentially a tube of muscle, and it is the common pathway for air, food and drink, branching midway down the neck. The throat (pharynx) divides into two near the top. The tube at the front is the windpipe (trachea),
which goes to the lungs. At the top of the airway is the voice box, or larynx - you can feel it as the Adam's apple in your neck. Behind the larynx is the gullet, or esophagus, the tube that takes food to the stomach. When we swallow the muscular soft palate (the back part of the roof of the mouth) lifts to close off the nasal cavities and stop food going upwards. The muscular throat then squeezes the food downwards into the esophagus. To stop the food going the wrong way, the larynx does two things: It acts as a valve to close off the airway; and it tips forward, out of the way - you can see this movement in the Adam’s apple.

Before swallowing food is chewed and held in the mouth. There is nothing in the throat, the windpipe is open and breathing occurs. When you swallow, the food is pushed into the throat, and the windpipe closes off. Food then slips down the tube at the back leading to the stomach. Because the windpipe is closed, you momentarily stop breathing. Once the food has passed through the throat, the windpipe opens up again and breathing can resume.

If you have any food or drink in your throat when your windpipe is open and you are breathing, there is a chance it could fall into the windpipe. This is experienced as ‘going down the wrong way’ and coughing usually ensues. Aspiration is when liquids or food do go down the wrong way and are not removed by coughing. A cough is the body’s response to ‘foreign bodies’ entering the airway or windpipe. It is our way of protecting our lungs from getting clogged up and interfering with breathing. Unfortunately, in addition to swallowing problems, ALS symptoms also often include weak respiratory function resulting in an inadequate ‘protective’ cough.

Difficulties in eating and/or swallowing can develop for a variety of reasons. The problem is best understood by looking at the three different stages involved in swallowing, and associated behaviors, separately.

1 **Oral Preparation Stage** - The lips, tongue, teeth and cheeks break up food, mix it with saliva and form a soft ball that can be swallowed. In the case of liquids, it is a question of control. The food or liquid is then gathered into the center of the tongue by using a sucking movement of the tongue, lips, and cheeks. The tongue forms a cupped shape around the liquid and holds it ready for swallowing. The entire bite or sip (bolus) is then pushed by the tongue to the back of the mouth, or oral cavity.

2 **Pharyngeal Stage** - The tongue squeezes the food or liquid to the back of the mouth and the swallow reflex is triggered. As the food is being pushed to the back of the mouth, the larynx rises and the vocal folds close to keep food out of the lungs. The soft palate rises to close off the nasal passage. This begins the involuntary portion of swallowing. The bolus is moved by muscles through the pharynx, past the closed larynx, and into the esophagus. Muscles in the wall of the throat assist movement of food/drink downwards to the stomach by wave like movements called peristalsis.

3 **Esophageal Stage** - This is the movement of food from the lower part of the throat, through the gullet (esophagus) to the stomach, assisted by a continuation of the peristaltic wave.

Problems with swallowing in ALS patients can arise at any of these stages, either in isolation or in combination. Muscle movements may become slow or uncoordinated; the swallow reflex can become delayed or incomplete; or the coordination of all three stages can become unbalanced.

**Diagnosis**

First a physician conducts an initial assessment and screening process. It is often beneficial to maintain a diary of the swallowing difficulties observed, including the setting in which the symptoms occurred, and with which foods or liquids. This will make the swallowing evaluation more thorough and the recommendations more specific to your needs. Then if the physician feels it is needed, a speech pathologist does a thorough evaluation.
In this evaluation the speech pathologist goes through the patient’s medical history, interviews the patient and family, and performs a swallowing assessment to see if there is a disorder. The swallowing assessment is where a speech pathologist gives a patient a variety of items including liquids, pureed foods (an eatable substance between solid and liquid), and solid foods in different consistencies to swallow. The speech pathologist observes the patients swallowing and determines if there is a problem.

If the speech pathologist feels the patient requires further evaluation, he/she will perform a swallow study. The objective is to show exactly what is happening when a patient swallows a variety of different consistencies and amounts. The speech pathologist takes the information from the swallowing study and determines the nature of the problem and what needs to be done. Swallowing studies can be performed using variety of techniques including:

- **Videofluoroscopy.** This is an x-ray recorded on videotape. For this test you drink different volumes and viscosities of barium solution.

- **Endoscopy.** A thin, flexible instrument called an endoscope is passed through your nose and down into your throat. An endoscope consists of a fiber optic tube with a miniature television camera on the end of it, which is used to look inside the body.

- **Manometry.** A small tube is inserted into your esophagus and connected to a pressure recorder. This measures the muscle contractions of your esophagus as you swallow.

**Strategies for Safer Swallowing**

Below are listed some common strategies and tips used to facilitate safe swallowing. It is, however, recommended that the advice of a speech language pathologist who specializes in swallowing disorders be sought, as recommended strategies will vary according to the stages of the swallow affected and the client. Other professionals, such as a dietician or occupational therapist may also need to be involved. Ways to promote safe eating that may be suggested by a speech and language therapist include:

**Swallowing Tips**

- Sit upright, preferably in a chair, during meals.
- Eliminate distractions such as television or conversation during meals.
- Concentrate on maintaining a slow, steady rate of feeding.
- Make sure the mouth and throat are clear of excessive secretions/saliva prior to eating or drinking.
- Avoid taking too large a bite, drinking too rapidly or placing more than one bite in your mouth before swallowing.
- Maintain the head in a slightly chin tucked position when eating or drinking. If you put your head back to drink you are opening up the airway more making it is easier for food and drink to go down the wrong way.
- Swallow two to three times to make sure all food has cleared your throat.
- Alternate swallowing food and liquids to assist with clearance of drier or more textured foods.
- Moisten food with sauces and gravy.
- Take small mouthfuls of food and small sips of drinks.
- Use a straw to drink liquids to enable you to keep your chin down.
Changes in Diet
Special diets (soft or puree), merely avoiding certain foods, or preparing them differently can make a big difference. There are also cookbooks available for those who have difficulty swallowing. Foods that may present difficulty for someone with a swallowing problem include:

- Items of mixed consistencies or textures such as cold cereal and milk, chicken noodle or vegetable soups and fruit cocktail. These items should be blended into one consistency.
- Highly textured foods such as red meats and raw vegetables.
- Dry foods such as rice, pretzels, potato chips, crackers and cookies.
- Stringy textures such as bacon, celery and string beans.
- Floppy textures such as lettuce and cabbage.
- Sticky foods such as mashed potatoes and peanut butter.
- Small, hard textures such as peanuts and corn.
- Dairy products, which often have a tendency to make secretions thicker.

Changes in Food Preparation
- Consider changing to soft, moist foods such as canned fruits or cooked vegetables, fish and chicken, complemented with gravies and sauces.
- Cooking food longer so it becomes softer. Mashing it with the back of a fork or liquefying it in a blender can help.
- Thickening fluids to yogurt consistency may help as they are easier to control. Thicken liquids with a commercial thickener (such as Thick-It, Thicken-Up, etc.), potato or banana flakes, or fruit purees.
- The use of nutritional supplements such as Ensure, Slim Fast and Carnation Instant Breakfast if necessary.
- Crushing medications or using a syrup form may be easier for someone with a swallowing problem but seek advice from your doctor or pharmacist as some tablets need to be taken whole.

General Suggestions
- It is important to maintain good oral hygiene.
- A portable suction machine may be of value to assist with clearance of secretions.
- Drinking more fluids will help keep secretions thin.
- Your physician may have suggestions for medications to thin or reduce secretions.
- Avoid medications that dry up secretions, making them thick and more difficult to manage.
- It is important that the caregiver be educated in the use of the Heimlich maneuver.
- Monitor the patient for dehydration and for weight loss.
- Be alert to the signs of pneumonia, including increased chest congestion, chronic low-grade fevers and increased cough.
- The use of nutritional supplements may be of value to increase caloric intake quickly and easily.
• Supervision during all meals is always a good idea.

Alternate Feeding Methods

Sometimes the strategies noted above may be insufficient to ensure an adequate dietary intake. If you find your intake of food and supplements is inadequate to maintain your weight or nutritional status or is just too risky because of choking, then it may be the time to consider alternative methods of eating. After discussion with your physician, speech pathologist and dietician it may be decided that feeding via a tube directly into the stomach is the best and safest option. This is called a feeding or PEG tube, and it can be used in conjunction with eating small amounts orally, or can be used alone. This is a very personal decision and should be discussed at length with family members and physicians. A feeding tube will provide adequate nutrition; however, it will not entirely eliminate the risk of aspiration. It is important that you consider this option early to prevent unnecessary complications. Studies suggest that early placement of the feeding tube can be utilized to supplement oral intake and allow you to eat more for pleasure.

Food and eating is central to living in terms of pleasure and socializing as well as survival, therefore eating and swallowing problems have a major impact both on the person directly affected and those caring for them. It is possible to compensate for many difficulties, and support and guidance from a speech pathologist can make the difference.