

## FEEDING AND SWALLOWING

Maureen A. Lefton-Greif

Feeding is a multidimensional activity. It requires the sequential coordination of gross and fine motor movements of the trunk, arms, hands and mouth, as well as the reflexive movements of swallowing. There must be enough motor control to permit a stable sitting position, to enable the individual to transfer food from the table to the mouth, and to chew the food enough to permit efficient swallowing. Normal swallowing then allows the safe transfer of food and liquid from the mouth to the stomach.

Normal feeding and swallowing ability are important for more than just these mechanics of eating. Mealtime is a social event that is often the focus of family interactions, from the routine weeknight dinner to the special holiday event. This chapter primarily focuses on swallowing and swallowing problems.

### Feeding and Swallowing Functions

Feeding and swallowing have two primary functions. The first function is to direct food, liquid and saliva from the mouth to the stomach while keeping the airway protected. The second is to provide enough of the right types of liquids and foods to permit adults to stay healthy and children to grow and develop.

We swallow approximately 600 hundred times each day. Most swallows occur during mealtimes; however, we swallow throughout the day and while we are sleeping. Each swallow consists of three phases – the **oral** (mouth), **pharyngeal** (throat), and **esophageal** (food tube) phases.

### Phases of Swallowing

The **oral phase** is the part of swallowing that occurs in the mouth and uses the jaw, lips, tongue, teeth, cheeks and palate (roof of the mouth). The functions of the oral phase are to prepare foods for swallowing and to deliver the swallow-ready food to the back of the mouth. Liquids and some foods (e.g., pudding, ice cream) are swallow-ready as soon as they enter the mouth. Food or liquid that is ready for swallowing is called a bolus (a “ball” ready to be swallowed). Some foods with texture and those that require chewing (e.g., sandwiches,

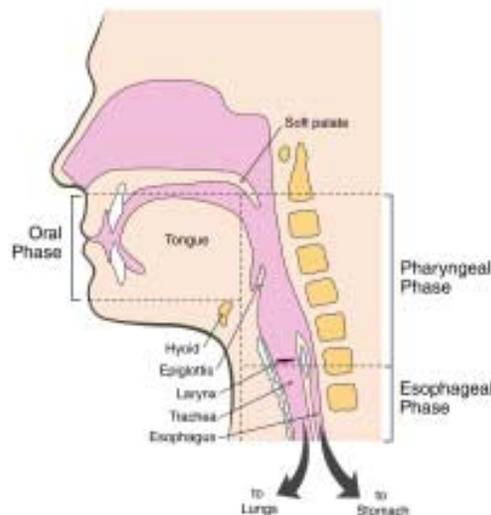


Fig. 7.1: The structures associated with the three phases of swallowing.

Each swallow consists of three phases:

- √ **oral** (mouth)
- √ **pharyngeal** (throat)
- √ **esophageal** (food tube)

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fresh fruit and vegetables, and meats) need to be prepared for swallowing. These items need to be formed into a bolus by being chewed and mixed with saliva. The oral phase is completed after the tongue, cheeks, and some of the muscles in the throat help move the bolus to the back of the back of the mouth.

The **pharyngeal phase** is the part of the swallow that occurs in the throat. During this phase, the bolus moves from the mouth, through the pharynx (throat), and into the esophagus. These actions occur while the airway is closed so that the bolus does not enter the airway (i.e., go down the “wrong pipe”). This phase of swallowing requires the rapid coordination of multiple structures. During the pharyngeal phase structures at the base of the tongue, soft palate (the muscle at back part of the roof of your mouth), epiglottis (the flap that covers the airway), pharynx, larynx (voice box), and muscle at the top of the esophagus all move quickly and each at the right time. The pharyngeal phase lasts less than one second.

The third phase of swallowing is the **esophageal phase**. During this phase, food is moved from the esophagus (“food pipe) into the stomach through a wavelike series of muscle actions.

### Swallowing Disorders

Swallowing disorders can cause breathing problems, limit a person's ability to get enough of the right types of liquids and foods to stay healthy, and make mealtimes difficult. **Dysphagia** (dis fay' jah) is the term used to describe a swallowing problem. Dysphagia may result from problems that affect one or more phases of swallowing. Examples of difficulties that may result from problems associated with specific phases of swallowing are listed below.

#### Oral Phase Problems

- Drooling or leakage of food or liquids from the mouth
- Difficulty chewing
- Excessively long times forming a bolus
- Difficulty clearing the mouth

#### Pharyngeal Phase Problems

- Choking and coughing when drinking or eating that result from items going down the “wrong pipe”
- Increased or chronic congestion, persistent coughing, frequent colds, or repeated pneumonia that may result from food or liquid entering the lungs
- The sensation of food “sticking in the throat” that may be caused by part of the bolus staying in the throat after the swallow

#### Esophageal Phase Problems

- Food or liquid moving back up into the esophagus from the stomach (reflux)

## Common Feeding and Swallowing Difficulties in Children with A-T

Feeding and swallowing problems become more common among people with A-T during the teenage years. Mealtime problems may be caused by factors related to the mechanics of self-feeding and/or problems that affect one or more of the phases of swallowing. For example, some people have excessively long mealtimes because it becomes harder to move food from the plate to the mouth. Others may have long mealtimes because chewing becomes more difficult, and it takes a longer time to finish each bite. Regardless of the reason(s), the impact of longer mealtimes may be that people do not eat enough, and so they lose weight and do not get the right balance of nutrition.

Teenagers with A-T often experience problems with the timing or coordination of the pharyngeal phase of swallowing. These problems may result in saliva, liquids and foods going down the “wrong way” (windpipe). **Aspiration** is the term used to describe materials getting into the windpipe (trachea). Sometimes liquid or food can enter the trachea without causing coughing or choking. **Silent aspiration** is the term used to describe aspiration that does not cause a person to cough. Silent aspiration may contribute to breathing problems. Although coughing and choking may signal the presence of a problem, these are normal reflexes that act in everyone from time to time and protect the lungs by “getting things” out of the airway. In many persons with A-T a significant problem is the absence of these reflexes when they should be provoked by aspiration. The failure to clear the airway may increase the risk of lung problems, including pneumonia. Furthermore, silent aspiration hides the fact that there is a swallowing problem. If a person does not cough or choke in response to aspiration, others may mistakenly believe that swallows occur without any problems.

### Warning Signs of a Swallowing Problem

The general guidelines listed below may assist you in recognizing the presence of a swallowing problem. If you notice any of these problems, your child’s swallowing should be checked carefully by a speech-language pathologist who works with a team of professionals that is experienced in feeding problems.

- Choking or coughing when eating or drinking
- Poor weight gain or weight loss
- Excessive drooling
- Mealtimes longer than 40 - 45 minutes, on a regular basis.
- Foods or drinks previously enjoyed are now refused or difficult
- Chewing problems
- Increases in the frequency or duration of breathing or respiratory problems

Silent aspiration may contribute to breathing problems. The failure to clear the airway may increase the risk of lung problems, including pneumonia.

## Ways to Compensate for Swallowing Difficulties

Regardless of age, feeding and swallowing routines must maintain a balance among three basic principles - safe swallowing, the ability to get enough of the right types of foods and liquids to stay healthy and grow when younger, and enjoyable mealtimes. A feeding and swallowing team should develop a plan that enables your child to balance these basic needs.

Currently, there is no cure for swallowing problems associated with A-T. However, some mealtime modifications may lessen problems for your child by making eating easier and lowering the risk of choking and aspiration. Some of the suggestions address potential problems associated with specific phases of swallowing and others focus on increasing the efficiency of mealtimes. Some of these modifications may not be helpful for your child because A-T affects each person in a slightly different manner. As the symptoms of A-T progress, swallowing may change and compensatory strategies may need to be re-evaluated. You should have on-going contact with a physician, speech-language pathologist, and dietitian to keep track of your swallowing program.

### How to Set Up Mealtimes or Snacks

- **EAT OFTEN.** Eat four to six small meals rather than three large meals daily to decrease fatigue. Eat nutritious items rather than “empty calories.” It takes the same amount of time and energy to drink a milkshake or instant breakfast shake as it does to drink juice, punch or soda. Snacks may be used as “mini-mealtimes.” Make mealtimes the most efficient.
- **SIT UPRIGHT.** A seated upright position is usually best for safe swallowing. It is a good idea to remain upright for a few minutes after eating.
- **HEAD POSITION.** The head, neck and trunk should be in a straight line. Try to have the chin pointed down and avoid positions where the head is tilted back (eyes towards the ceiling).

### How to Eat and Drink

- **SMALL BITES.** Cut food into small pieces. Place small amounts of food or liquid in the mouth. Make sure each bite is swallowed before taking more. Pieces of food that collect in the mouth may fall into the throat and cause choking.
- **USE STRAW CAREFULLY.** If drinking through a straw, encourage one sip at a time. The likelihood of aspiration is increased with rapid sips through a straw. The straw may be pinched to slow the rate of drinking.
- **ALTERNATE SWALLOWS.** Alternate food and liquid swallows to help clear the mouth and the throat.

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## What to Eat

- **PUREES OR SOFT FOODS.** Foods that stay together in the mouth may be easiest for your child to swallow. If purees or soft foods seem easier for your child, think of how you can convert favorite foods into textures similar to the foods listed below:
  - Pudding, custard, yogurt or creamed cereals (e.g., oatmeal)
  - Soft pasta with sauce (e.g., macaroni and cheese)
  - Canned, stewed or baked fruit
  - Ground or stewed meat moistened with ketchup or gravy
- **AVOID DRY OR FLAKY FOODS THAT BREAK INTO SMALL PIECES.** These foods may be difficult to prepare for swallowing. Examples of dry flaky foods are crackers, cookies and chips. Foods that fall apart in the mouth (e.g., rice, cake) may also be difficult. In general, moisten dry, flaky foods with butter, jelly, margarine, sauces or gravy.
- **AVOID FOODS THAT ARE DIFFICULT TO CHEW.** Some solid foods may require extra effort to chew and swallow. These foods may increase the time it takes to eat and make it difficult for the child to consume enough of the “right” types of foods. Foods that are difficult to chew are some meats (e.g. steak, pork chops), and raw vegetables and fruits (e.g. lettuce, apples, raw carrots).
- **AVOID FOODS THAT ARE STICKY OR GUMMY.** These foods are hard to prepare for swallowing and may stick in the mouth or throat. Examples of sticky or gummy foods are thick mashed potatoes, white bread, peanut butter and pizza.

## What to Drink

- **MINIMIZE VERY THIN LIQUIDS.** Avoid water, fruit juice, punch and soda. These liquids do not provide many calories per ounce. Furthermore, although thin liquids might seem to be the safest food for individuals with swallowing problems, in fact this seems to be the most difficult consistency for A-T patients to handle.
- **OFFER THICK LIQUIDS.** Thick liquids are milkshakes, malts, fruit nectars and creamed soups. Even the difference between whole milk and skim milk may decrease the risk of aspiration and will certainly improve the caloric value of the drink.
- **THICKEN LIQUIDS.** If necessary, thicken liquids by adding rice cereal, arrowroot, fruit puree, or a commercially available product such as Thick-It®.

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- **ADD LIQUID SUPPLEMENTS.** Introduce liquid or food supplements, instant breakfast products, and/or milkshakes to boost your child's diet as per instructions from a pediatrician or dietitian.

### **How to Control Drooling**

- **SWALLOW OFTEN.** Remind your child to swallow frequently. Some children have been successful by wearing sweat bands on the wrist and using them to wipe their mouths.
- **MEDICATIONS.** Medications may be used to control excessive saliva. If drooling continues to be a problem, talk with your child's pediatrician. Learn about the side effects associated with medications that control the production of saliva.

### **Emergency Plan<sup>1</sup>**

- **DEVELOP A PLAN.** Anyone with swallowing difficulties should have an emergency plan in case the airway gets blocked and prevents breathing. Your child, all caregivers, a physician and a rescue unit should develop this plan. This plan should be printed and posted for easy reference. If your child's airway does become blocked, here is an emergency plan you might follow:
- **TRY TO RELAX.** Attempt to remain calm while you encourage your child to cough forcefully and to try to breathe around the blockage.
- **DO THE HEIMLICH MANEUVER.** If the blockage does not move, try the Heimlich maneuver (abdominal thrust).
- **CALL 911.** If the airway remains blocked, call your local emergency phone number for assistance.
- **HAVE A SIGNAL.** Develop a system of signals to guide caregivers through these steps. For example, a hand tap to indicate, "Stop, I don't need help" and a hand placed on the throat to indicate, "Please help me."
- **REVIEW THE PLAN.** Periodically re-examine and revise the plan to keep it current. Maintain up-to-date CPR training.

<sup>1</sup> Adapted from Yorkson KM, Miller RM, Strand EA,(1995). Management of Speech and Swallowing in Degenerative Diseases. Communication Skill Builders, a Division of The Psychologic Corporation.Tucson: p.249.