



HOW DO WE SWALLOW AND WHAT CAN GO WRONG?

Minseo Kim¹, Shreya Bera¹, Samantha E. Shune^{2*} and Ashwini Namasivayam-MacDonald^{1*}

¹School of Rehabilitation Science, McMaster University, Hamilton, ON, Canada

²Communication Disorders and Sciences, University of Oregon, Eugene, OR, United States

YOUNG REVIEWERS:



ARIANA

AGE: 8



SRIJA

AGE: 11

For many people, swallowing is an automatic and frequent daily activity. However, some people experience difficulties with swallowing, also called dysphagia, which can include trouble swallowing specific kinds of foods or drinks, or even not being able to swallow at all. It can be common for dysphagic people to cough up anything they eat or drink, to choke, or to feel as if food is stuck in the throat or chest. The inability to eat or drink properly can take away from fun social events like parties and outings. Since dysphagia can cause many problems both physically and emotionally, it is important to identify warning signs and seek treatment. Dysphagia can be managed and treated by speech-language pathologists, who make recommendations for types of foods to eat, assign exercises to strengthen swallowing muscles, and offer other ways to make living with dysphagia a lot easier.

WHEN SWALLOWING GOES WRONG...

How many of these have you done before?

- Traded lunch with your friends at school.
- Added extra butter to your popcorn at the movie theater.
- Shared a cake with your family and friends on your birthday.
- Experimented with trying different soda combinations.
- Celebrated holidays with a big family dinner.

What do all these things have in common? They all involve eating or drinking and, to do that, you need one very important skill: swallowing! So many special and ordinary moments of our lives involve food and drinks. For many of us, the ability to swallow feels so automatic that it is a no-brainer. But what happens if swallowing does not come so easily? If you have ever had food or drink “go down the wrong pipe,” then you have experienced one example of how swallowing can go wrong. Around 1 in 25 adults and 9 in 1,000 children experience difficulties when swallowing [1]. Imagine going to your favorite restaurant and feeling scared or embarrassed about coughing up your drink in front of everyone. It is easy to see how dysphagia can make small but important things in your life challenging.

PHARYNX

The part of the body that leads from the mouth to the esophagus and trachea.

ESOPHAGUS

The tube connecting the throat to the stomach that is meant to carry food and drinks only.

TRACHEA

The tube connecting the throat to the lungs that is meant to carry air only.

SWALLOWING REFLEX

A built-in security system during the swallowing process that automatically closes off the airway and pushes food safely through the throat, into the esophagus.

HOW DO WE SWALLOW?

As easy as it seems, swallowing is an incredibly complex process that requires many precise steps to happen in the right order and at the right time. Did you know that the “simple” act of swallowing uses around **50 pairs of muscles**? Swallowing can be split up into three stages:

The first stage happens in your mouth. This is probably what you imagine first when you think of eating. You begin by placing the food (or liquid) into your mouth. You then use your teeth to chew the food into smaller pieces, if necessary. And of course, one of the best parts of eating happens here—tasting! When you are ready for the next bite, your tongue moves your food to the back of your mouth, to pass it into your throat for the next stage of swallowing [2].

The second stage happens in your **pharynx** (“FAIR-inks”), or throat. Your throat connects to two tubes—one tube, the **esophagus** (“uh-SAW-fuh-giss”), leads food and drink down to your stomach, and the other, the **trachea** (“TRAY-kee-uh”), moves air into and out of your lungs. It is very important that food goes down the right tube, or it could end up in your lungs and make you sick! Luckily, your body has a built-in security system, called a **swallowing reflex** (“REE-fleks”; **Figure 1**). As part of this security system, when food or drinks reach your pharynx, your body automatically squeezes the top of your air

EPIGLOTTIS

The flap that covers the top of the trachea during swallowing so that food and drinks do not enter the lungs.

Figure 1

The swallowing reflex. In stage 1, your tongue pushes the food or drink to the back of your pharynx (the throat). When this happens, your brain automatically tells your vocal folds and epiglottis to close off the trachea leading to your lungs, leaving just your esophagus open for food to enter and go to your stomach (stage 2). This series of events is called the swallowing reflex.

DYSPHAGIA

A medical condition that results in difficulty swallowing food, drinks, medications, and/or saliva.

tube closed with your vocal folds and puts a “cap” on it, using a flap of tissue called the **epiglottis** [2] (“ep-uh-GLOT-us”).

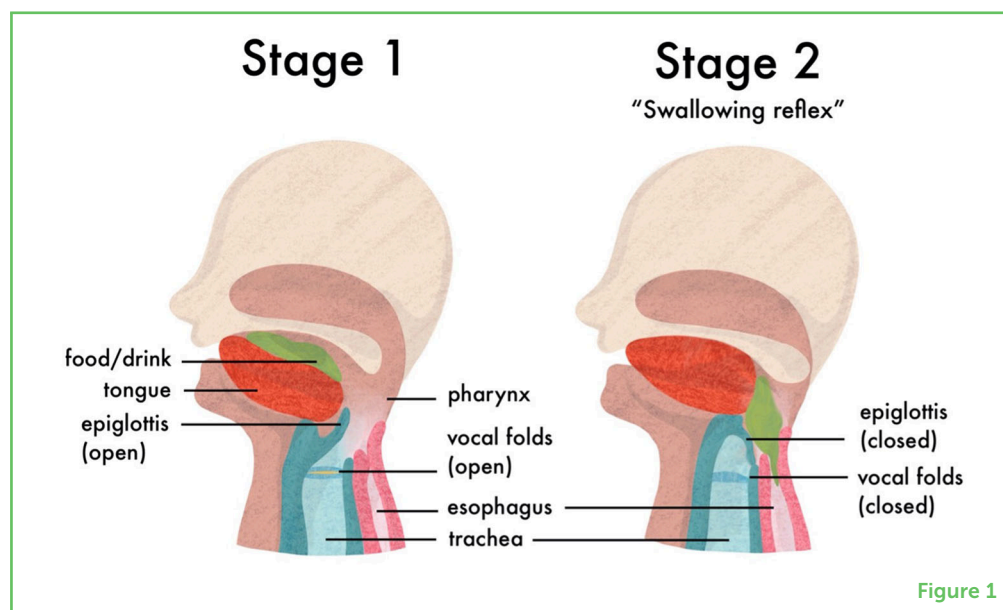


Figure 1

In the last stage, food continues to travel down your esophagus to be digested in your stomach. To make sure that food does not come back up, your esophagus has one-way doors at its beginning and end that open on the way down and close right after the food passes [2].

WHAT ARE SWALLOWING DISORDERS?

Dysphagia (“dis-FAY-juh”) is the scientific word used to describe any troubles with swallowing. Dysphagia can look different depending on where the swallowing process went wrong. For example, food and drinks “going down the wrong pipe” happens when your throat muscles do not work together properly to close off the trachea. Other forms of dysphagia include food getting stuck in your pharynx, needing extra time to swallow, or food rising back up through your esophagus and into your mouth.

Your brain gives instructions to almost every part of your body. So, any damage to your brain, such as from hitting your head really hard or bleeding in the brain (called a stroke), could lead to dysphagia. Other causes include damage to the muscles in your head and neck, such as bad neck injuries, and medical conditions that can affect your brain and/or muscles, like cerebral palsy, Down syndrome, or autism spectrum disorder [3]. These medical conditions are the result of differences in the way a child’s brain develops, and those differences can cause unique ways of thinking, feeling, moving, and behaving. While these medical conditions can cause dysphagia, it is not only something that runs in families; dysphagia can happen to anyone with one of the medical conditions mentioned.

ASPIRATION PNEUMONIA

A sickness that happens when food or drinks are breathed into the lungs instead of being swallowed.

SPEECH-LANGUAGE PATHOLOGIST

A medical professional who specializes in treating swallowing difficulties, in addition to speech, language and thinking difficulties.

You may be surprised at how a swallowing disorder can cause enormous problems *outside* of your mouth and throat. Struggling every time you eat and drink might make you want to avoid food and drinks altogether, meaning you would not be getting enough food and water into your body. This can be dangerous to your health, weakening your body's muscles and your ability to fight off sicknesses. If germs and bacteria from your mouth accidentally make it to your lungs, this can cause a serious sickness called **aspiration pneumonia** ("new-MO-nee-uh"). You can also imagine how dysphagia would take a lot of the fun out of celebrations like birthdays, parties, and holidays, when eating is a main activity. Missing out all the time might make you feel lonely, embarrassed, or sad. The good news is that there are ways to help solve some of these issues and there are many people who can support those with dysphagia.

WHAT ARE SOME COMMON WARNING SIGNS?

People can have warning signs during each of the phases of swallowing. For example, food and drinks might leak out of your mouth if you are unable to close your mouth completely. You may start to choke or cough when trying to swallow because the muscles in your throat do not work properly to push the food down to the esophagus or to protect the trachea. Stomach acid, which is important for digesting food, might go back up your esophagus, which can feel like chest pain [1]. You may also start to lose a lot of weight if the food and drink is not reaching your stomach; dysphagia can lead to much larger problems if people do not get enough nutrients or water. As we mentioned, many of these warning signs can interfere with regular activities, whether it be trying out a new snack with a friend or enjoying a refreshing lemonade on a hot sunny day. If you or someone you know is experiencing these warning signs, you should reach out to the Dysphagia Team for help!

WHO CAN HELP?

The Dysphagia Team is a group of professionals who help identify and treat swallowing problems. **Speech-language pathologists** ("path-ALL-oh-gist") are a major part of the team. They can identify the signs of dysphagia and suggest the best types of food and drinks for you to swallow, like softer, easier-to-swallow foods including applesauce or yogurt, and drinks that are thicker than normal, like smoothies [1]. Speech-language pathologists also come up with treatment plans, and they teach patients, friends, and family members all about swallowing [1]. Other people on the team include occupational therapists, nurses, physicians, and dietitians, all with specific roles. Occupational therapists can help with the skills required to feed yourself. Nurses can give you medications and help keep your mouth clean while you are in the hospital, and physicians can

help you manage the consequences of dysphagia, including aspiration pneumonia. Dietitians can help you get the essential nutrients you need if any changes to your food and drink are recommended by the speech-language pathologist. While each person has a unique job to do, everybody works together to help people with dysphagia improve their ability to swallow and manage their swallowing problems to make everyday life less difficult.

WHAT DOES DYSPHAGIA MANAGEMENT LOOK LIKE?

Let us look at an example of a boy named Josh, who finds eating and swallowing very challenging. Josh feels pain when he tries to swallow and often chokes on his food. He feels left out and embarrassed at birthday parties or restaurants, since he cannot eat a lot of the foods offered. His parents take him to a speech-language pathologist to evaluate his swallowing. The speech-language pathologist uses video x-rays to see what is going on with his swallowing muscles (Figure 2).

Figure 2

Josh's swallowing x-ray. Speech-language pathologists can use a video x-ray to see a patient's swallowing muscles. Here you can see Josh is having a hard time swallowing his food because the food goes down the wrong pipe, which causes Josh to choke.



After the tests, the speech-language pathologist explains that Josh has some areas of weakness in his swallowing muscles and diagnoses him with dysphagia. Josh even gets to watch a video of his swallowing x-ray to see what is going on. Along with the other members of the Dysphagia Team, the speech-language pathologist gives Josh some dysphagia tips and instructions on how to improve his ability to swallow. He also learns how to sit a little differently while eating and learns to eat softer foods so that swallowing becomes easier. He now has an appointment with a dietician to make sure he gets all the nutrients he needs to grow while eating softer foods.

REMEMBER THIS!

Now that you have become an expert on swallowing, remember that while dysphagia can make some parts of life difficult, it does not make it impossible! If you can catch on to the warning signs and ask the right people for help, learning to eat and drink with dysphagia can become easier—it just might look a little different! Just because something is different does not mean that it is bad. For people living with dysphagia, movie theaters, birthday parties, and restaurants can still be filled with happy and yummy memories, just like they are for everybody else!

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YOUNG REVIEWERS



ARIANA, AGE: 8

Ariana loves to know how the body works. She is always curious. She is fascinated about learning all she can about how to improve humans and animals' lives. She is passionate and enthusiastic. One of her favorite things to do is sitting down on the sofa looking at books or videos about the body or about animals. She wants to be a vet when she grows up.



SRIJA, AGE: 11

Hello my name is Srija. During the winter, I spend my time doing indoor activities such as cake & cookie making, arts, painting, and of course watching movies. During the summer I visit places. I like swimming and riding around the town. I do involve in a lot of extracurricular activities, including the school choir and local community cultural activities. Following a career in medicine particularly in pediatrics would be a dream come true.

AUTHORS



MINSEO KIM

Minseo Kim is an undergraduate student at McMaster University. She is completing her bachelor's degree in health sciences with a specialization in child health. She is currently researching engagement in pediatric rehabilitation and exploring the field of speech-language pathology.



SHREYA BERA

Shreya Bera is an undergraduate student studying life sciences at McMaster University. Her current research involves the fields of maternal health and emotional regulation in children. Her interests lie in speech-language pathology and rehabilitation programs.



SAMANTHA E. SHUNE

Samantha E. Shune, Ph.D., CCC-SLP, is an Associate Professor and the Director of the Communication Disorders and Sciences Program at the University of Oregon. Her research and clinical interests include the effects of healthy aging and disease on swallowing and mealtimes. *sshune@uoregon.edu



ASHWINI NAMASIVAYAM-MACDONALD

Ashwini Namasivayam-MacDonald, Ph.D., CCC-SLP, SLP(C), is a speech-language pathologist and Assistant Professor at McMaster University. Her teaching and research are focused on swallowing disorders in adults. *namasia@mcmaster.ca