



Apraxia of Speech in Adults

What is apraxia of speech?

Apraxia of speech is a motor speech disorder. The messages from the brain to the mouth are disrupted, and the person cannot move his or her lips or tongue to the right place to say sounds correctly, even though the muscles are not weak. The severity of apraxia depends on the nature of the brain damage. Apraxia can occur in conjunction with [dysarthria](#) (muscle weakness affecting speech production) or [aphasia](#) (language difficulties related to neurological damage). Apraxia of speech is also known as *acquired apraxia of speech*, *verbal apraxia*, and *dyspraxia*.

Children can also have apraxia, referred to as [childhood apraxia of speech](#).

What are some signs or symptoms of apraxia of speech?

Individuals with apraxia of speech know what words they want to say, but their brains have difficulty coordinating the muscle movements necessary to say all the sounds in the words. As a result, they may say something completely different or make up words (e.g., "bipem" or "chicken" for "kitchen"). The person may recognize the error and try again—sometimes getting it right, but sometimes saying something else entirely. This situation can become quite frustrating for the person.

Individuals with apraxia may demonstrate:

- difficulty imitating and producing speech sounds, marked by speech errors such as sound distortions, substitutions, and/or omissions;
- inconsistent speech errors;
- groping of the tongue and lips to make specific sounds and words;
- slow speech rate;
- impaired rhythm and *prosody* (*intonation*) of speech;
- better automatic speech (e.g., greetings) than purposeful speech;
- inability to produce any sound at all in severe cases.

What causes apraxia of speech?

Apraxia of speech is caused by damage to the parts of the brain that control coordinated muscle movement. A common cause of acquired apraxia is [stroke](#). Other causes include [traumatic brain injury](#), [dementia](#), brain tumors, and progressive neurological disorders.

How common is apraxia of speech?

There is not a lot of research about how many people have apraxia of speech. Many times apraxia of speech occurs together with other communication disorders, such as [aphasia](#).

How is apraxia of speech diagnosed?

A speech-language pathologist (SLP) uses a combination of formal and informal assessment tools to diagnose apraxia of speech and determine the nature and severity of the condition. The assessment typically includes examinations of the individual's oral-motor abilities, melody of speech, and speech sound production in a variety of contexts.

What treatments are available to people with apraxia of speech?

An SLP can work with people with apraxia of speech to improve speech abilities and overall communication skills. The focus of intervention is on improving the planning, sequencing, and coordination of muscle movements for speech production. The muscles of speech often need to be "retrained" to produce sounds correctly and sequence sounds into words. Exercises are designed to allow the person to repeat sounds over and over and to practice correct mouth movements for sounds. The person with apraxia of speech may need to slow his or her speech rate or work on "pacing" speech so that he or she can produce all necessary sounds. In severe cases, [augmentative and alternative communication](#) may be necessary (e.g., the use of simple gestures or more sophisticated electronic equipment).

Dysarthria

What is dysarthria?

Dysarthria is a motor speech disorder. It results from impaired movement of the muscles used for speech production, including the lips, tongue, vocal folds, and/or diaphragm. The type and severity of dysarthria depend on which area of the nervous system is affected.

What are some signs or symptoms of dysarthria?

A person with dysarthria may demonstrate the following speech characteristics:

- "Slurred," "choppy," or "mumbled" speech that may be difficult to understand
- Slow rate of speech

- Rapid rate of speech with a "mumbling" quality
- Limited tongue, lip, and jaw movement
- Abnormal pitch and rhythm when speaking
- Changes in voice quality, such as hoarse or breathy voice or speech that sounds "nasal" or "stuffy"

What causes dysarthria?

Dysarthria is caused by damage to the brain. This may occur at birth, as in cerebral palsy or muscular dystrophy, or may occur later in life due to one of many different conditions that involve the nervous system, including

- stroke,
- brain injury,
- tumors,
- Parkinson's disease,
- Lou Gehrig's disease/amyotrophic lateral sclerosis (ALS),
- Huntington's disease,
- multiple sclerosis.

How common is dysarthria?

There are no known data about the incidence of dysarthria in the general population, because of the broad variety of possible causes.

What are the types of dysarthria?

Find an explanation and definitions of the many types of dysarthria online at [The Neuroscience on the Web Series](#).

How is dysarthria diagnosed?

A speech-language pathologist (SLP) can evaluate a person with speech difficulties and determine the nature and severity of the problem. The SLP will look at movement of the lips, tongue, and face, as well as breath support for speech and voice quality. The assessment will also include an examination of speech production in a variety of contexts.

What treatment is available for people with dysarthria?

Treatment depends on the cause, type, and severity of the symptoms. An SLP works with the individual to improve communication abilities. Some possible goals of treatment include:

- Slowing the rate of speech
- Improving the breath support so the person can speak more loudly

- Strengthening muscles
- Increasing tongue and lip movement
- Improving speech sound production so that speech is more clear
- Teaching caregivers, family members, and teachers strategies to better communicate with the person with dysarthria
- In severe cases, learning to use [alternative means of communication](#) (e.g., simple gestures, alphabet boards, or electronic or computer-based equipment)

How effective are speech-language pathology treatments for dysarthria?

ASHA produced a [treatment efficacy summary on dysarthria](#) [PDF] that describes evidence about how well treatment works. This summary is useful not only to individuals with dysarthria and their caregivers but also to insurance companies considering payment for much needed services for dysarthria.

What can I do to communicate better with a person with dysarthria?

It is important for both the person with dysarthria and the people he or she communicates with to work together to improve interactions. Here are some tips for both speaker and listener.

Tips for the Person With Dysarthria

- Introduce your topic with a single word or short phrase before beginning to speak in more complete sentences.
- Check with the listeners to make sure that they understand you.
- Speak slowly and loudly and pause frequently.
- Try to limit conversations when you feel tired—when your speech will be harder to understand.
- If you become frustrated, try to use other methods, such as pointing or gesturing, to get your message across or take a rest and try again later.

Children may need additional help to remember to use these strategies.

Tips for the Listener

- Reduce distractions and background noise.
- Pay attention to the speaker.
- Watch the person as he or she talks.
- Let the speaker know when you have difficulty understanding him or her.
- Repeat only the part of the message that you understood so that the speaker does not have to repeat the entire message.

- If you still don't understand the message, ask yes/no questions or have the speaker write his or her message to you.

Stroke:

What is a stroke?

A *stroke* is when a clogged or burst artery interrupts blood flow to the brain. This interruption of blood flow deprives the brain of needed oxygen and causes the affected brain cells to die. When brain cells die, the functioning of the body parts that they control is impaired or lost. A stroke can cause paralysis or muscle weakness, loss of feeling, speech and language problems, memory and reasoning problems, swallowing difficulties, problems of vision and visual perception, coma, and even death.

What causes a stroke?

Stroke can be caused by either blockage of blood vessels in the brain (by clots that have either formed in the brain or that were formed elsewhere and migrated to the brain) or by bleeding in or around the brain (from burst arteries due to weak spots in the artery wall or due to high blood pressure).

How common is stroke?

According to the [Centers for Disease Control and Prevention](#), each year strokes affect more than 795,000 Americans, almost 130,000 of whom die as a result.

What are the signs/symptoms of a stroke?

Common warning signs of a stroke include:

- sudden numbness or weakness of the face, arm, and/or leg;
- sudden confusion, trouble speaking, or difficulty understanding speech;
- sudden difficulty seeing in one or both eyes;
- sudden trouble walking, dizziness, loss of balance, or loss of coordination;
- sudden severe headache with no known cause.

How is a stroke diagnosed?

A stroke is diagnosed by medical professionals. Special tests that allow doctors to look at the person's brain (CT scan, MRI) are often used to determine where the stroke occurred and how severe it is.

What deficits result from a stroke?

Because of the organization of the nervous system, an injury to one side of the brain affects the opposite side of the body. The consequences of a stroke may include physical, sensory, cognitive-communication, swallowing and emotional issues.

- Physical deficits after stroke are characterized by muscle weakness or paralysis, typically on one side of the body. Often, the person loses movement and/or feeling in the arm and/or leg opposite the side of the brain affected by the stroke. So, if a person has a stroke on the left side of the brain, he or she may have weakness or paralysis in the right arm and leg. This makes it difficult for the person to perform activities of daily living (e.g., dressing, feeding, bathing, tying shoes, etc.). Physical effects also include pain, fatigue, changes in muscle tone, and gait disturbances.
- Sensory deficits can involve all sensory modalities depending on the areas of the brain that are involved. A stroke can result in the individual being either less or more sensitive to sensations, experiencing altered sensations, or being unable to synthesize sensations to identify his or her own location in space. Sometimes (more typically in right hemisphere brain damage) a person may be able to see objects in only certain parts of his or her field of vision after the stroke. Sensory deficits may also impact gait and balance.
- Communication deficits are characterized by difficulty in understanding or producing speech correctly ([aphasia](#)), slurred speech consequent to weak muscles ([dysarthria](#)), and/or difficulty in programming oral muscles for speech production ([apraxia](#)). These deficits vary in nature and severity depending on the extent and location of the damage. Some individuals may also have difficulty in social communication, such as difficulty taking turns in conversation and problems maintaining a topic of conversation.
- Cognitive deficits include (but are not limited to) difficulties in attention, awareness, orientation, memory, problem solving, and reasoning skills. Individuals who have suffered a stroke may also have trouble concentrating when there are internal and external distractions (e.g., carrying on a conversation in a noisy restaurant, dividing attention among multiple tasks/demands).
 - Swallowing deficits ([dysphagia](#)) may also result from a stroke due to weakness and/or incoordination of muscles in the mouth and throat.
- Emotional deficits may be marked by the display of inappropriate emotions and extreme mood fluctuations. The affected individual may laugh when something isn't funny or cry for no apparent reason. This behavior is particularly common early in the recovery process. A stroke survivor may become very frustrated with the inability to function independently—a situation that may lead to anger and depression.

What does a speech-language pathologist (SLP) do when working with individuals with a stroke?

As part of a medical team, the SLP diagnoses and treats cognitive-communication and swallowing deficits after a stroke. The treatment program focuses on improving the skills that have been affected by the stroke, depending on what areas are affected.

To [improve the patient's ability to understand or produce language](#), the SLP will work on specific drills and strategies, such as:

- retraining word retrieval;
- having the patient participate in group therapy sessions to practice conversational skills with other stroke survivors;
- holding structured discussions, focusing on improving initiation of conversation, turn-taking, clarification of ideas, and repairing of conversational breakdowns;
- role-playing common communication situations that take place in the community and at home, such as talking on the telephone or ordering a meal in a restaurant.

Later in the recovery process, the SLP may work with a vocational specialist to help transition the person back into work or school, if applicable. The SLP may also work with the employer and/or an educational specialist to implement the use of compensatory strategies—for example, modifying the patient's work/school environment to meet language and/or cognitive needs.

Individuals may also require speech-language pathology services to improve speech production if they have difficulty due to [muscle weakness](#) or [deficits in motor programming](#). They may also be taught strategies to make speech more intelligible and to compensate for the muscle weakness. The SLP can also evaluate a person's ability to use [augmentative or alternative communication \(AAC\)](#) devices and techniques to supplement the individual's verbal communication.

The SLP can evaluate a person's [swallowing function](#) and make recommendations that involve positioning issues, feeding techniques, diet consistency changes, and education of the person with stroke, family members, or caregivers.

If cognitive skills are affected, some treatment strategies may include:

- using a memory log to keep track of daily happenings to help with memory;
- using an organizer to plan tasks;
- increasing awareness of deficits in order to help self-monitoring in the hospital, home, and community.

How effective are treatments for a stroke?

ASHA has written a treatment efficacy summary for [aphasia resulting from left hemisphere stroke](#) [PDF] and for cognitive-communication disorders resulting from [right hemisphere brain damage](#) [PDF] that describe evidence about how well treatment works. These summaries are useful not only to individuals with stroke and their caregivers, but also to insurance companies considering payment for much-needed services for stroke.

Aphasia

What is aphasia?

Aphasia is a communication disorder that results from damage to the parts of the brain that contain language (typically in the left half of the brain). Individuals who experience [damage to the right side of the brain](#) may have additional difficulties beyond speech and language issues. Aphasia may cause difficulties in speaking, listening, reading, and writing, but does not affect intelligence. Individuals with aphasia may also have other problems, such as [dysarthria](#), [apraxia](#), or [swallowing problems](#).

What causes aphasia?

Aphasia is most often caused by [stroke](#). However, any disease or damage to the parts of the brain that control language can cause aphasia. These include brain tumors, [traumatic brain injury](#), and progressive neurological disorders.

What are some signs or symptoms of aphasia?

The specific symptoms and severity of aphasia vary depending on the location and extent of brain damage. Individuals with damage to the front part of the brain may have "choppy" or non-fluent speech. However, they can typically understand what people say fairly well. Those with damage to the posterior regions of the brain often have fluent speech—that is, the rate and rhythm of speech may sound normal. However, their speech may contain the wrong words or made-up words. They also typically have difficulty understanding what is spoken.

Additionally, all individuals with aphasia may also have one or more of the following problems:

- Difficulty producing language:
 - Experience difficulty coming up with the words they want to say
 - Substitute the intended word with another word that may be related in meaning to the target (e.g., "chicken" for "fish") or unrelated (e.g., "radio" for "ball")
 - Switch sounds within words (e.g., "wish dasher" for "dishwasher")
 - Use made-up words (e.g., "frigilin" for "hamburger")
 - Have difficulty putting words together to form sentences
 - String together made-up words and real words fluently but without making sense
- Difficulty understanding language:
 - Misunderstand what others say, especially when they speak fast (e.g., radio or television news) or in long sentences
 - Find it hard to understand speech in background noise or in group situations
 - Misinterpret jokes and take the literal meaning of figurative speech (e.g., "it's raining cats and dogs")
- Difficulty reading and writing:
 - Difficulty reading forms, pamphlets, books, and other written material
 - Problems spelling and putting words together to write sentences
 - Difficulty understanding number concepts (e.g., telling time, counting money, adding/subtracting)

How common is aphasia?

The National Institute on Neurological Disorders and Stroke estimates that approximately one million individuals suffer from aphasia in the United States.

How is aphasia diagnosed?

The speech-language pathologist (SLP) evaluates the individual with a variety of tools to determine the type and severity of aphasia. It includes assessment of:

- Auditory Comprehension: understanding words, questions, directions, and stories that are spoken
- Verbal Expression: producing automatic sequences (e.g., days of the week), naming objects, describing pictures, responding to questions, and having conversations
- Reading and Writing: understanding or producing letters, words, sentences, and paragraphs
- Functional Communication: using gestures, drawing, pointing, or other supportive means of communication when he/she has trouble getting a point across verbally

What treatments are available for people with aphasia?

There are many types of treatment available for individuals with aphasia. The type of treatment depends on the needs and goals of the person with aphasia. Treatment may be provided in individual or group sessions. The speech-language pathologist (SLP) works on activities to improve specific language skills affected by damage to the brain. The SLP also helps the person with aphasia develop and use strategies to improve overall communication in a variety of situations (e.g., [life participation approach to the treatment of aphasia](#)). Later on in recovery, the SLP may work with a vocational specialist to help the person return to work or school, if appropriate. The SLP may also work with employers and/or educational specialists to implement the use of compensatory strategies in these settings and may work with them to modify the environment to meet language needs.

How effective are treatments for aphasia?

ASHA produced a [treatment efficacy summary on aphasia](#) [PDF] that describes evidence about how well treatment works. This summary is useful not only to individuals with aphasia and their caregivers but also to insurance companies considering payment for much needed services for aphasia.

What can I do to communicate better with the person with aphasia?

1. Get the person's attention before you start speaking.
2. Maintain eye contact and watch the person's body language and use of gesture.
3. Minimize or eliminate background noise (TV, radio, other people).
4. Keep your voice at a normal level. Do not speak loudly unless the person asks you to do so.
5. Keep communication simple, but adult. Don't "talk down" to the person with aphasia.
6. Simplify your sentence structure and emphasize key words.

7. Reduce your rate of speech.
8. Give the individual time to speak. Resist the urge to finish sentences or offer words.
9. Communicate with drawings, gestures, writing, and facial expressions in addition to speech.
10. Encourage the person to use drawings, gestures, and writing.
11. Use "yes" and "no" questions rather than open-ended questions.
12. Praise all attempts to speak and downplay any errors. Avoid insisting that that each word be produced perfectly.
13. Engage in normal activities whenever possible.
14. Encourage independence and avoid being overprotective.

Voice Therapy

Why is voice therapy recommended for hoarseness?

Voice therapy has been demonstrated to be effective for hoarseness across the lifespan from children to older adults (Ramig & Verdolini, 1998; Thomas & Stemple, 2007). Voice therapy is the first line of treatment for vocal fold lesions like vocal nodules, polyps, or cysts (Anderson & Sataloff, 2002; Johns, 2003). These lesions often occur in people with vocally intense occupations like teachers, attorneys, or clergymen (Roy et al., 2001). Another possible cause of these lesions is vocal overdoing often seen in sports enthusiasts; in socially active, aggressive, or loud children; or in high-energy adults who often speak loudly (Boone et al., 2005; Rubin et al., 2006; Stemple et al., 2000; Trani et al., 2007).

Voice therapy, specifically the Lee Silverman Voice Treatment method, has been demonstrated to be the most effective method of treating the lower volume, lower energy, and rapid rate of speech in persons with Parkinson's disease (Dromey et al., 1995; Fox et al., 2006).

Voice therapy has been used to treat hoarseness concurrently with other medical therapies like botulinum toxin injections for spasmodic dysphonia and/or tremor (American Academy of Otolaryngology-Head and Neck Surgery, 2005; Murry & Woodson, 1995; Pearson & Sapienza, 2003). Voice therapy has been used alone in the treatment of unilateral vocal fold paralysis (Miller, 2004; Schindler et al., 2008) and has been used to improve the outcome of surgical procedures as in vocal fold augmentation (Rosen, 2000) or thyroplasty (Billiante et al., 2002). Voice therapy is an important component of any comprehensive surgical treatment for hoarseness (Branski & Murray, 2008).

What happens in voice therapy?

Voice therapy is a program designed to reduce hoarseness through guided change in vocal behaviors and lifestyle changes. Voice therapy consists of a variety of tasks designed to eliminate harmful vocal behavior, shape healthy vocal behavior, and assist in vocal fold wound healing after surgery or injury. Voice therapy for hoarseness generally consists of one to two therapy sessions each week for 4–8 weeks (Hapner et al., 2009). The duration of therapy is determined by the origin of the hoarseness and severity of the problem, co-occurring medical

therapy, and, importantly, patient commitment to the practice and generalization of new vocal behaviors outside the therapy session (Behrman, 2006).

Who provides voice therapy?

Certified and licensed speech-language pathologists are the health care professionals with the expertise needed to provide effective behavioral treatment for hoarseness (American Speech-Language-Hearing Association, 2005).

Does insurance cover voice therapy?

Generally, Medicare will cover voice therapy provided by a certified and licensed speech-language pathologist if referred by a physician and based on a medical diagnosis. Medicaid coverage varies from state to state; it is best to contact your local Medicaid office.

Private insurance companies vary. Consumers should contact their insurance company for specific guidelines about their purchased policies.

Are speech therapy and voice therapy the same?

Speech therapy is a term that encompasses a variety of therapies including voice therapy. Most insurance companies refer to voice therapy as speech therapy, but they are the same if provided by a certified and licensed speech-language pathologist.