

Dysarthria and Dysphonia

Dysarthria

Dysarthria refers to a speech difficulty that may occur following an injury or disease to the brain, cranial nerves or nervous system. Injury or disease to the speech musculature may also cause dysarthric like symptoms. When the part of the brain that controls speech production is damaged, the link from the brain to the muscles of speech is affected. Dysarthria can present in varying degrees of severity depending on localization and severity of brain damage. The production of speech sounds may be very difficult and in some cases speech may not be possible. The lips, tongue, palate, facial muscles, and the vocal folds (chords) may be uncoordinated or immobile. Further difficulties may occur if breathing is also affected as the lungs provide the energy for speech. An individual with dysarthria may have slurred, hoarse, jerky or strained speech and may be difficult to understand or completely unintelligible. Intelligibility may be further hindered by low volume, variable rate and rhythm, and irregular pitch. As well as traumatic brain injury, dysarthria can be caused by brain tumour, stroke, cerebral palsy, long term use of certain medication, and degenerative diseases such as Parkinsons. Other co-occurring problems may include difficulties with swallowing and saliva control.

Types of dysarthria

Ataxic dysarthria can cause poor coordination of the speech muscles meaning that speech and volume is slow, erratic and irregular. Speech maybe explosive and extra stress may be put on syllables.

Flaccid dysarthria can cause a breathy voice that is often nasal in quality (because of poor control of the soft palate). There is often an obvious paralysis or weakness of the facial muscles.

Spastic dysarthria can cause a very slow, indistinct, monotone voice, and at times it may seem strained with some sounds being difficult to articulate.

Hyperkinetic dysarthria presents with a harsh, strained voice.

Hypokinetic dysarthria presents with a hoarse voice and low volume.

A Mixed dysarthria can have a mix of the symptoms mentioned above, and will depend on the type of neuron damage as to whether speech is more harsh or breathy.



Treatment of Dysarthria

A speech and language pathologist / therapist (SLPT) can work on improving speech difficulties caused by dysarthria. Depending on the severity of the brain damage, speech may not return to normal. However, the SLPT can focus on exercises and compensatory strategies to help improve speech production and intelligibility. The SLPT may also focus on alternative forms of communication or assistive communication to help the individual with dysarthria express themselves and be understood. For those with a mild to moderate dysarthria, speech should still be their main form of communication. For those with severe dysarthria, looking at other ways to communicate may be appropriate.

Muscle Exercises

There are a wide variety of exercises and approaches, and their use will depend on the patient, severity and location of the brain lesion or disorder (cerebral palsy, traumatic brain injury, stroke etc), and the type of dysarthria. For instance, with flaccid dysarthria, muscle strengthening exercises may be appropriate, but for dysarthria that presents with increased muscle tone and poor coordination, relaxation exercises may need to be performed. Muscle strengthening exercises may involve a series of movement and stretching exercises of the face, jaw, lips and tongue. Other exercises may include isometric exercises, where the muscles push against other stationary objects with force e.g. pushing your tongue against a spoon etc.

Breathing Exercises

Breathing exercises may also be helpful, as poor breath control will effect volume and sentence length. Our lungs are the bellows, the power source that creates the energy for speech. Not only has our breath got to be powerful enough, but it also has to be timed right. The execution of speech is a precise coordination of many muscles and if our breathe is out of sync, then speech production does not work very effectively. Speech will also be affected if you speak till your breath runs low, as your speech will tend to decrease in volume and intelligibility. There are many exercises to improve breath control and timing.

See www.icommunicatetherapy.com for more information on breathing and muscle exercises for speech.



Compensatory Strategies

Compensatory strategies may include, slowing speech (this is probably the most obvious way to become more intelligible), or producing each word, or syllable individually, rather than in a stream of connected speech. This does not present with very natural sounding speech, but can increase intelligibility. Speaking by pronouncing each syllable can be taught using a metronome or teaching the clients to tap their fingers to keep in time. Some people just choose to use key words to get their message across. Over emphasizing facial and articulatory movement and over emphasizing consonants in speech has also been shown to improve intelligibility. Stopping for a breath every few words is another strategy that works for some people, as speech will be slowed and extra power will be given to voice.

Gesture or visuals

Add gesture to your speech to give the listener another cue to help them understand. Have a book or sheet of visuals of core subjects. This can help cue people into what you are saying by putting them in the context of your conversation.

Alphabet Chart

Evidence has shown that using an alphabet chart can greatly enhance intelligibility. Not just by spelling out entire words, but by just pointing to the initial letter/sound of a word often cues in the listener to the word you are trying to pronounce. Alternatively, writing or drawing a diagram may also help to communicate a message.

Go to www.icommunicatetherapy.com for a free alphabet and number chart.

Hi-tech Augmentative / Assistive communication aids

Depending on the degree of your dysarthria, it may be beneficial to use a hi-tech communication device. There are a range of these machines that offer speech output, either by typing your message or accessing visual symbols on a screen via touch or scanning. Some also offer predictive text, so when you type in a letter, you are provided with a number of common words starting with that letter (this saves you typing the whole word). Lo-tech options such as an E-tram frame and partner assisted scanning, can also work well for communication. See www.icommunicatetherapy.com for more examples of assistive technology, software, and lo-tech options to facilitate communication following a stroke, brain injury or degenerative disease.



Adapting the environment to help the dysarthric person

To facilitate communication ensure that you communicate in an environment that is free from noise and distractions. Look at the dysarthric person when they are talking to see lip movements, facial expression and gesture, all of which will give you cues to facilitate intelligibility. Allow the individual time to get their message across and have a pen and paper at hand for words or diagrams if they are needed.

Factors that Influence prognosis

Obviously general health and the extent of the illness or trauma will have an effect on the outcome, especially if the disease is progressive, but there are other factors that can influence prognosis. Younger patients generally have a better prognosis, as do those who get good medical treatment and follow-up Speech and Language Therapy input. A positive and motivated disposition prior to, and following the diagnosis of dysarthria, and having good support systems in the form of family and friends usually provides the basis for a better prognosis.

Dysphonia

Dysphonia is a hoarseness, weakness or loss of voice. Following a stroke, disease, or trauma to the larynx, there can be a paralysis of the vocal folds (often called the vocal cords) and weakness of the muscles relating to phonation. This can cause a change or loss of voice.

Organic Dysphonia occurs when there is a physical problem with the vocal apparatus which effects the voice, such as an infection like laryngitis, a structural abnormality such as a nodule, a tumorous growth, or a trauma to the larynx.

Functional Dysphonia relates to a voice disorder where there is not a structural abnormality of the larynx, such as a polyp, or any paralysis, but a voice problem exists. This dysphonia usually occurs because of the incorrect use of voice or a psychogenic reason.

How the voice works

Voice is powered by air from the lungs, the air passes through the larynx which contains the vocal folds. The vocal folds are 2 folds of muscle that meet together many times per second (approximately 125 per second for men and 210 times for woman) when we want to produce voice.

The meeting together of the vocal folds creates the voice which resonates in the pharynx, oral and nasal cavities, and is then shaped into words by the speech apparatus, the tongue, lips, facial muscles etc.



What goes wrong?

A number of things can cause voice problems and these are usually associated with the larynx. Within the larynx are the vocal folds. If these get damaged or a growth develops on one of them it will affect the voice. If the vocal folds cannot come together properly, then air can escape between them causing croaky or breathy speech. Weak breath control can also cause voice to be weak or at a low volume.

Following a stroke, injury, brain injury or the development of a degenerative disease, the vocal folds may become paralysed. One or both vocal folds may be paralysed, and this will affect the voice and intelligibility. Compensatory strategies or alternative forms of communication may have to be considered to allow the individual to communicate effectively.

When one vocal fold is damaged or paralysed surgery can sometimes improve voice. The paralysed vocal fold can be “bulked up” with another substance such as Teflon, collagen or body fat, and this reduces the space between the 2 folds allowing the working fold to meet the paralysed fold. Alternatively, surgery involving to push the paralysed vocal fold closer to the centre of the larynx may be performed. The working fold can then make better contact with the paralysed fold and voice is improved..

Vocal hygiene

If you have a voice problem of any sort there are a few things that you can do to look after your voice:

Breathing correctly is one of the best ways to improve your voice. Breath from the diaphragm and take deep breathes before you speak. Do not continually talk until you run out of air. If you breath rom your chest, rather than from your stomach (shallow breathing), you are not using your breath for speech correctly and not supplying as much power for speech as you could. Having a good posture will help with your breathing technique.

Stay hydrated and drink lots of water continually through the day. Avoid drinking too many caffeinated drinks or too much alcohol.

Try to relax and reduce excess tension because this will effect your posture, your breathing, and the muscles of your throat and neck which will impact on your voice.

Avoid clearing your throat or whispering. Many people with voice difficulties feel the need to constantly clear their throat, and are often doing this without thinking about it. Throat clearing can really aggravate voice difficulties. Some suggest either doing a hard swallow or taking a sip of water rather than throat clearing. Contrary to what many people believe, whispering is not good for protecting your voice, because the vocal folds have to work harder when whispering.



Try to stop or reduce smoking as the smoke passes directly over the vocal folds. Smoking can respiratory illness, laryngeal cancer and other health problems which can all impact on voice.

Medications such as inhalers can coat the pharynx and vocal folds, drying them out. One way to help with this is to stay well hydrated and drink lots of water. Talk to your doctor if you feel that your medication may be effecting your voice.

Reflux at night this can also cause voice problems. If you think this might be causing your problems, see your doctor for some relevant medication.

Avoid work environments that are smoky or dusty.

For more information about dysarthria, dysphonia, stroke or brain injury, and activities and exercises to facilitate communication see our website www.icommunicatetherapy.com .



To learn more about voice and voice problems go to our website www.icommunicatetherapy.com, or read about and purchase books from our Online Resource centre by clicking this link:

[Book Shop](#)

Suggested Reading:

Motor Speech Disorders by James Paul Dworkin

Motor Speech Disorders: Substrates, Differential Diagnosis, and Management
by Joseph R. Duffy PhD, Mayo Clinic

Clinical Management of Sensorimotor Speech Disorders by Malcolm McNeil

Introduction to Neurogenic Communication Disorders by Robert H. Brookshire
PhD CCC/SP

Language Intervention Strategies in Aphasia and Related Neurogenic Communication Disorders by Roberta Chapey (Editor)

Manual of Aphasia and Aphasia Therapy by Nancy Helm-Estabrooks

Voice and Voice Therapy (with Free DVD), 7th Edition by Daniel R. Boone, Stephen C. McFarlane, and Shelley L. Von Berg

Treatment of Voice Disorders by Robert Thayer Sataloff

Greene and Mathieson's The Voice and its Disorders, 6th Ed. by Lesley Mathieson

Voice and Laryngeal Disorders: A Problem-Based Clinical Guide with Voice Samples by Sally K. Gallena

Laryngeal Cancer - A Medical Dictionary, Bibliography, and Annotated Research Guide to Internet References by ICON Health Publications

The Voice Clinic Handbook by Harris, Tom Harris, John S. Rubin, and David M. Howard

Voice Disorders and Their Management by Margaret Freeman and Margaret Fawcus

Clinical Assessment of Voice by Robert Thayer Sataloff