

Understanding Spasmodic Dysphonia

What is Spasmodic Dysphonia?

Spasmodic dysphonia is a chronic neurological voice disorder and a focal laryngeal dystonia. It results in involuntary spasms of the muscles that open or close the vocal folds, causing a voice that presents with breaks and strained/strangled quality or breathy quality, depending on the type of spasmodic dysphonia (adductor or abductor).

Is the Cause of Spasmodic Dysphonia Known?

Spasmodic dysphonia is known to be neurological in origin but currently the exact cause is not known. Investigation into the specific causes of the disorder is on-going and different areas of the brain may be involved. Researchers are looking at the basal ganglia which helps to regulate movement; the cerebellum which helps to control balance; along with the cortex which initiates movement and senses sensation. There may also be genetic component as genes have been identified in other forms of dystonia.

How is Spasmodic Dysphonia Diagnosed?

Generally, an otolaryngologist (ENT) and speech language pathologist will do a comprehensive evaluation, which includes collection of medical history, review of current and onset of symptoms, visualization of vocal fold movement through a stroboscopy exam (an endoscopy through the nose or mouth with a special camera and light which permits detailed visualization of vocal fold vibration), ratings of different voice qualities (i.e. overall severity, breaks, roughness, strain, breathiness), a recording of the voice to obtain acoustic (sound-based) measures, and aerodynamic evaluation to provide more information to the functioning and coordination of the voice mechanism. Palpation of the neck may be included to determine the presence of tension in and around the larynx. The individual may also be asked to read or repeat several specific sentences to aid in proper diagnosis.

Different sentence probes may be used to help differentiate the type of SD present. Adductor spasmodic dysphonia results from spasms in the muscles that close (adduct) the vocal folds and presents with phonation breaks after *voiced* consonants and in words that are started with a vowel. Abductor SD results from spasms in the muscles that open (abduct) the vocal folds and presents with breathy breaks after *voiceless* consonants (/p/, /t/, /k/, /h/). Some individuals may have aspects of both types, and may be diagnosed with the mixed type of spasmodic dysphonia.

Adductor Sentence Probe Examples	Abductor Sentence Probe Examples
Count from 80 to 89	Count from 60 to 69
We eat eels every day	The puppy bit the tape
We mow our lawn all day	Peter will keep at the peak
Where were you a year ago?	How hard did he hit him?
We eat eggs every Easter	Boys were singing songs outside of our house

What are Common Treatment Options for Spasmodic Dysphonia?

Learning all you can about treatments for spasmodic dysphonia will help you partner with your healthcare team to evaluate your options, manage your symptoms, and enhance your quality of life.

Botulinum Toxin Injections

Botulinum toxin is injected into the laryngeal muscles that control the opening (abduction) and closing (adduction) of the vocal folds. The most common brand currently used for spasmodic dysphonia is Botox[®] and it works to eliminate spasms of the muscles that control the vocal folds by blocking nerve impulses at the muscle receptor site which normally signal the muscle to contract. The specific laryngeal muscle injected will depend on the type of SD; typically the thyroarytenoid (TA) muscle for adductor type and the posterior cricoarytenoid (PCA) for abductor type. This weakening effect is only temporary and thus, Botox[®] injections need to be repeated. The duration of benefit of Botox[®] varies from person to person but the average length is 3-4 months. Individuals may experience temporary side effects from Botox[®] injections including breathiness, difficulty swallowing, or pain/soreness at the site of injection. Individuals may be given strategies to cope with these effects by the treating ENT or speech language pathologist at the time of injection. These side effects typically do not last long, but may be more significant as the dosage of Botox[®] increases. Some ENTs provide the option of unilateral injections, through which only one side of the voice mechanism is injected. This results in less powerful or less duration of the Botox[®] effect, but also with less side effects following the injection. Discussion of unilateral versus bilateral injections, and specific dosage of Botox[®] will be based on the wishes of the person, recommendations of the treating professionals, and individual responses from the past few Botox[®] injections.

Common Treatment Options, *continued*

Voice Therapy

Voice therapy cannot cure spasmodic dysphonia, as it is a neurological disorder; however, people may find benefit to re-coordinating the speech subsystems (breathing patterns, phonation, resonance, articulation) and to work in a more efficient way to be able to better manage symptoms of SD including breaks, strain, roughness, breathiness, and effortful voicing. Voice therapy is provided by a Speech Language Pathologist (specialized voice therapist) and can teach a person behavioral strategies to better manage SD symptoms. Voice therapy should incorporate individual goals such as strategies for speaking in groups, speaking on the phone, speaking with less effort, etc. It can provide individuals with education on spasmodic dysphonia, appropriate vocal health habits, in addition to counseling for coping with the quality of life impairments of the disorder. Voice therapy has also been shown by some studies to be an effective adjunct to Botox® injections.

Surgical Options

Several surgical options exist to treat spasmodic dysphonia. The majority of surgeries are designed to treat adductor spasmodic dysphonia. In Selective Laryngeal Adductor Denervation-Reinnervation (SLAD-R) involves cutting the recurrent laryngeal nerve which innervates the thyroarytenoid and lateral cricoarytenoid muscles and reinnervating the muscles with a different nerve. In Type II Thyroplasty surgery, the surgeon separates the vocal folds slightly, to result in less severe spasms. This may result in a weaker or breathier voice, but with less severe spasms. Research is still being conducted on long-term results. For abductor spasmodic dysphonia, a procedure call Bilateral Vocal Fold Medialization can be considered where a silastic implant or an insoluble injection material is placed either through a surgical incision or with an injection through the front of the neck. If surgery is an option, potential risks and benefits should be discussed with the treating ENT.

Differentiating Spasmodic Dysphonia from Related Voice Conditions

Often times, spasmodic dysphonia can mimic or present similarly to other disorders, in addition to possibly co-occurring with other disorders, like vocal tremor or muscle tension dysphonia (MTD). Individuals may try to compensate for spasmodic dysphonia symptoms, which may result in increased strain/muscle tension or breathiness, which could present similarly to other types of SD, MTD, or tremor. Additionally, symptoms of spasmodic dysphonia vary highly both within and between individuals. All of these factors make it challenging to accurately diagnose spasmodic dysphonia. Below are some differences between spasmodic dysphonia, MTD, and tremor.

Spasmodic Dysphonia	Muscle Tension Dysphonia	Tremor
<ul style="list-style-type: none">• Symptoms elicited with certain speech contexts (i.e. vowel onsets, or after voiced/voiceless phonemes)• Sound-specific phonation breaks• Response to “sensory tricks” – typically no symptoms with high pitch, singing, laughing, emotional speech• May show improvement with alcohol• Laryngeal tension is secondary/compensatory• Typically progressive for up to two years, then stable• Onset typically 4th-5th decade of life• Often responsive to Botox® injections	<ul style="list-style-type: none">• Symptoms apparent in all speech contexts – no change with certain sounds/tasks• Excess primary laryngeal tension• Functional voice disorder (caused by inefficient voice patterns), not neurological• Onset at any age• Remediated with voice therapy	<ul style="list-style-type: none">• Symptoms elicited best in sustained speech• Regular fluctuations in pitch or loudness• Typically no improvement in symptoms with alcohol• Neurological in origin• Botox® treatment is not as effective as for SD

Quality of Life Effects of Spasmodic Dysphonia

A handful of studies have documented psychosocial factors and quality of life impairments in those with spasmodic dysphonia. Many individuals with SD feel that their voices don’t accurately portray emotions, personality, and competence. Individuals experience physical, emotional, and functional losses including emotional distress, loss of job or salary, forced career change, reduced social participation, and negative changes in personal relationships due to spasmodic dysphonia. These findings highlight the importance of education, counseling, and expansion of treatment options for the SD population, in addition to the need for further research

For more information on spasmodic dysphonia and related voice conditions, to view ongoing research, or to seek a NSDA support group visit the National Spasmodic Dysphonia Association website at dysphonia.org.

Special thanks to Christie DeLuca, MS, CCC-SLP for preparing this informative information sheet.