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ABSTRACT

This leaflet provides a summary of research and recent advances in understanding stuttering. Stuttering is defined as a disorder in which the rhythmic flow of speech is frequently disrupted by repetitions of sounds or syllables. The leaflet outlines possible causes of stuttering, methods of measurement of fluency and work on a uniform method of measurement, common factors involved with stuttering, and the process of speech formation. Relevant activities of the National Institute on Deafness and Other Communication Disorders are described, and a list of four organizations to call on for additional information is provided. (JDD)

Update on Stuttering

The National Institute on Deafness and Other Communication Disorders (NIDCD) has primary responsibility at the National Institutes of Health (NIH) for supporting research on stuttering. The NIDCD, which became one of the institutes of the NIH in October 1988, supports research and research training on normal and disordered processes of hearing, balance, smell, taste, voice, speech, and language. This insert provides an update of current research and recent advances in understanding stuttering.

Stuttering is a disorder in which the rhythmic flow, or fluency, of speech is frequently disrupted by repetitions of sounds or syllables. Often, stutterers form prolonged vowel sounds, repeat monosyllabic words like "and" or "if," or sometimes experience complete verbal blocks in which no words are spoken. There are over 15 million stutterers in the world, most of whom began stuttering at a very early age. Stutterers of all ages, however, have overcome their stutter through regulated speech-language therapy.

The cause of stuttering is unknown. Many scientists believe stuttering is associated with the intricate muscles involved in speech and vocal cord regulation. Some investigators suggest that psychological reasons may be responsible. Still others believe that it relates to a complex interaction between stutterers' ability to produce speech and the psycho-social environment they experience while speaking.

Much of the current stuttering research focuses on finding a uniform and reliable method of measurement of fluency. Current measurements of the various types of stuttering along with its severity and frequency are subjective, relying almost entirely on a doctor's or therapist's judgement. In the search for an objective measurement, scientists have investigated many different approaches. Some scientists are studying the pathways of nerves that relay information back and forth from the brain to the muscles involved with speech. Plugging into these pathways, or neural networks, with devices like electrodes that measure the nerves' electrical activity can provide a foundation for measuring the severity of a patient's stuttering.

Other NIDCD scientists are studying heart rates. A changing heart rate of a stutterer can provide clues to muscle activity and emotional reactions as the patient casually converses with a therapist. In other studies, investigators are developing low-cost speech analysis programs for personal computers. These computer programs can be standard systems in speech clinics across the country, providing clinicians a uniform measure of fluency.

Once a uniform method of measurement is developed, speech-language pathologists can more accurately assess their patients' stuttering problems and design better therapy treatments for these patients. Through different forms of therapy, stutterers can learn to relax the muscles inside their throat and mouth or speak in softer tones or slower speeds.

Some scientists are searching for common characteristics or factors involved with stuttering. One current research project is tracing 40 stuttering children, probing their family history. In addition to collecting genetic and social background information, scientists are investigating the children's response times to a particular word or set of instructions. This will test the theory that stutterers respond or react to a given situation at a slower rate than nonstutterers. This does not mean, however, that stutterers are less intelligent; it simply suggests that stutterers may produce and respond to language differently.

Whatever causes stuttering, it is clear that it involves a breakdown in fluent speech formation. Scientists, therefore, are investigating the physiological basis for stuttering to understand what causes the disorder.

But speech formation is one of the most complicated skills that a human can learn. What's more, speech can be affected by emotions like excitement or nervousness, which are sometimes magnified when the stutterers realize that their disrupted speech may be making the listener uncomfortable or impatient. To produce speech, the diaphragm pushes air through the lungs to the vocal folds or voice box in the larynx. As air passes between these folds, the folds vibrate, resonating the airflow as it continues up the throat. Then, over 100 different muscles in the throat, mouth and tongue fine-tune this resonation into intelligible language. In addition, speech is produced only after a complicated cognitive process, tapping into a reservoir of nearly a million words in the English language and organizing this information into proper grammar and usage.

As a result, stuttering is a complex problem involving the brain, the muscles, and the emotional processes—incorporating both the psychological history of the stutterer and how that stutterer reacts emotionally to everyday conversations. A problem with any combination of these can cause or exacerbate stuttering. Scientists, therefore, are investigating all of these processes to explain why stuttering can occur or even worsen. As scientists continue to learn more about the physiological causes of stuttering, they can develop better treatment strategies for patients of all ages to overcome their stuttering problems.

About the NIDCD

The NIDCD conducts and supports research and research training on normal and disordered mechanisms of hearing, balance, smell, taste, voice, speech and language. The NIDCD achieves its mission through a diverse program of research grants for scientists to conduct research at medical centers around the country and a wide range of research performed in its own laboratories.

The institute also conducts and supports research and research training related to disease prevention and health promotion; addresses special biomedical and behavioral problems associated with people who have communication impairments or disorders; and supports efforts to create devices that substitute for lost and impaired sensory communication function. The NIDCD is committed to understanding how certain diseases or disorders may affect women, men, and members of the underrepresented minority populations differently.

The NIDCD has established a national clearinghouse of information and resources. Additional information on stuttering may be obtained from the NIDCD Clearinghouse. Write to:

NIDCD Clearinghouse
P.O. Box 37777
Washington, DC 20013-7777

For additional information:

American Speech-Language-Hearing Association
10801 Rockville Pike
Rockville, MD 20852
(301) 897-5700 or (800) 638-TALK

National Stuttering Project
4601 Irving Street
San Francisco, CA 94122-1020
(415) 566-5324

The Council for Exceptional Children
Division for Children With Communication Disorders
1920 Association Drive
Reston, VA 22091-1589
(703) 264-9435

Stuttering Foundation of America
P.O. Box 11749
Memphis, TN 38111-0749
(901) 452-7343 or (800) 992-9392

This publication was prepared by:

Program Planning and Health Reports Branch
National Institute on Deafness and
Other Communication Disorders
National Institutes of Health
Bethesda, Maryland 20892
Telephone: (301) 496-7243
TDD: (301) 402-0252

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