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Large-Scale Study Examines New Treatment for Adults Who Stutter

For an adult who stutters, the mere act of introducing oneself is enough to cause sweaty palms, heart palpitations, and worse. When particular sounds or syllables don't roll easily off the tongue, articulating something as familiar as one's name can become a struggle.

Stuttering affects more than three million people in the United States, although it occurs most frequently in young children as their language skills begin to develop. Children generally outgrow the disorder, but it can become a chronic problem for the roughly one percent who carry it into adulthood. Adult onset of the disorder also can occur, usually due to a brain injury, mental illness, or even a drug overdose. Stuttering is one of the most commonly known speech disorders, but the most difficult to treat effectively, especially in adults. At the present time, no cure for the disorder exists.

That may change, however, following a large scale, five-year study currently being conducted by Roger Ingham, professor of speech and hearing at the University of California, Santa Barbara, to evaluate a protocol he developed to treat adults with stuttering disorder. The study, supported by a \$2.5 million grant from the National Institute on Deafness and Other Communication Disorders, marks the second phase of clinical trials to determine the treatment's efficacy. The first was completed in 2001 with an initial group of five test subjects.

As many as 50 adults are participating in the study, which began last summer and takes place at the Research Imaging Center at the University of Texas Health Science Center in San Antonio, where Ingham is currently an adjunct professor. The treatment is being evaluated in conjunction with brain imaging, specifically, positron emission tomography (PET), and is part of a continuing collaboration between Ingham and Peter Fox, director of the Research Imaging Center. Ingham directs the activity and monitors the participants' progress via the Internet.

Although each of the five speakers in the initial study achieved and maintained stutter-free and natural-sounding speech when tested 12 months after completing the program, the second study hasn't continued long enough to produce quantitative results. If it proves as successful as the first, however, the treatment protocol could represent a breakthrough in effective and reliable treatment for stuttering in adults.

Stuttering occurs when speech is interrupted by repetition or prolongation of a particular sound or syllable. Stuttering may also be characterized by other speech difficulties such as the blocking of sounds or interjection of words or sounds. In either case, unusual facial and body movements during speech also may be present. According to Ingham, approximately 40 to 80 percent of children with the disorder recover, for various reasons, by adolescence or adulthood. In addition, the disorder affects three times as many males as females in childhood and 10 times as many in adulthood. Genetics seem to play a role as well, with approximately 60 percent of people who stutter having a family member with the same disorder.

A few well-known adults who stutter include singer Carly Simon and actor James Earl Jones. Naturalist Charles Darwin, Prime Minister Winston Churchill, and scientist Isaac Newton also suffered from the disorder. For many others, however, stuttering has devastating effects on social and vocational success, Ingham noted.

Ingham's treatment protocol, called Modifying Phonation Intervals (MPI), uses a software program he developed in association with Martin Kilgo, Richard Moglia, and Anthony Felino—former staff members in the Speech and Hearing Department—and Ingham's wife Janis, also a professor in the department.

"People who stutter are vulnerable to not being able to control rapid onset and offset of particularly short intervals of phonation," said Ingham. "The treatment trains the stutterer to alter his or her custom of speech to avoid those short intervals."

MPI treatment is divided into five successive phases: pretreatment, establishment, transfer, maintenance, and follow-up. The three middle phases consist of a series of speaking exercises, each of which is more difficult than the last. While pretreatment is directed entirely by a clinician, the subsequent phases are largely self-managed by the participant in conjunction with the computer program.

The treatment protocol takes about a year-and-a-half to complete, and during that time patients receive five sets of PET scans so researchers can examine changes in the regions of the brain that Ingham and his colleagues believe relate functionally to stuttering.

"We're looking at what neural changes accompany treatment and, more specifically, what neural changes occur in people for whom it's helpful and for whom it isn't," said Ingham. "We're looking to see whether critical regions of the brain are changed."

According to Ingham, recent imaging studies on adults who stutter have revealed unusual regional activations and deactivations in cerebral blood flow during stuttered speech, particularly in the brain's right hemisphere. The critical areas involve the motor and auditory system, and are modified considerably when stuttering is reduced or absent during known fluency-inducing strategies such as MPI treatment. The unusual neural activity appears to occur only during speech and is mainly evident in the premotor cortex, as well as in the basal ganglia and insula. Cerebellar activations are remarkably prominent, more than double the magnitude found in control subjects (although this is not the case for females who stutter). Also, significant inhibitions have been located in the auditory association area. These findings have intensified the search for a dysfunctional neurological system that might be functionally related to stuttering.

While identifying stuttering is relatively easy, treating it is not. Many of the favored therapies, however, such as Ingham's MPI protocol, are behavioral and focus on helping the adult who stutters learn new ways of speaking. Drug therapy and the use of electronic devices also are utilized in some treatment programs, although neither has proved effective, Ingham said.

The preferred treatment for adults who stutter, he continued, involves a combination of three general features similar to those provided by the MPI protocol: a method that establishes reduced or stutter-free speech under relatively controlled

conditions; a method for transferring that improvement beyond the treatment setting; and strategies for maintaining improvement.

Ingham, who received his Ph.D. from the University of New South Wales in Sydney, Australia, has published three books and more than 170 papers on stuttering as a speech disorder. His research has focused on the development of stuttering treatments, measures of stuttering, the neurology of stuttering, and, most recently, its genetic basis. He has been awarded the Honors of the American Speech-Language-Hearing Association (ASHA), and has received the prestigious Order of Australia for his research.

About UC Santa Barbara

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