

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

Abstract

The purpose of this report is to describe how Internet web-camera technology may be used as an effective telepractice tool for the management of childhood stuttering. A family from North Texas, approximately 200 miles from San Marcos, contacted the first author for intervention with a 7-year-old boy. Because distance precluded the family from attending sessions in San Marcos on a regular basis, an Internet web-camera procedure was adopted. Issues regarding adopting a telehealth model of treatment are discussed. A graphical model depicting the sequence of events during stuttering provided an objective means by which the family could follow changes in the child's speech. A stuttering modification approach was utilized. Results indicated excellent progress in reducing stuttering and speech-related struggle. In addition, the parents reported an increase in positive communication skills on the part of their child.

Using Web-camera Technology in the Family Management of Stuttering: A Case Study

The purpose of this paper is to describe how web-camera technology has been adopted into a family-based stuttering program in San Marcos, Texas. The program was modeled after the work of the late Lena Rustin (Rustin, 1987) and the staff at the Michael Palin Centre for Stammering Children in London, England. Both intensive and non-intensive therapy formats have been implemented (Mallard, 1998a, b). The intensive therapy format has typically been conducted during a two-week period in the summer. The non-intensive format has been available for families that live in close proximity to San Marcos and who can meet typically on a weekly basis. Given the specialty services for stuttering and the availability of a unique clinical approach, referrals have been received from across the state of Texas, as well as from other states across the country ranging from Oregon to Connecticut.

Because of the extensive distance some families live from San Marcos, it sometimes makes regular attendance to clinical appointments unfeasible. Technology has afforded new avenues of communication and treatment in all areas of health care service delivery. Clinicians now have such conveniences as electronic mail and video conferencing to communicate with clients virtually anywhere in the world instantaneously. However, before such a program is initiated, several factors must be considered.

Factors to be Considered before Adopting a Telehealth Model of Treatment

It is highly recommended that clinicians read the ASHA position statements: "Speech-language pathologists providing clinical services via telepractice: Position statement" (American Speech-Language-Hearing Association, 2005a), "Knowledge and skills needed by speech-language pathologists providing clinical services via telepractice (American Speech-Language-Hearing Association, 2005b), and "Speech-Language pathologists providing clinical services via telepractice:

Technical report" (American Speech-Language-Hearing Association, 2005c) prior to adopting a telepractice model with clients. The issues of ethics, technology, client selection, selections of assessments and interventions, cultural/linguistic variables, support personnel, evaluation of effectiveness and outcomes, documentation, licensure, liability, reimbursement, malpractice, and reimbursement are discussed in depth. It is beyond the scope of this paper to discuss each of these issues independently. It might be useful, however, for the reader to know the questions we asked and the justifications we gave prior to adopting a telepractice model with the family described in this report.

Question 1: Is telepractice ethical in a family-based model for the treatment of stuttering? The ASHA position on telepractice is: "It is the position of the American Speech-Language-Hearing Association (ASHA) that telepractice (telehealth) is an appropriate model of service delivery for the profession of speech-language pathology." (American Speech-Language-Hearing Association, 2005a). The ASHA Code of Ethics (American Speech-Language-Hearing Association, 2003) states that "Individuals may practice by telecommunication (for example, telehealth/e-health), where not prohibited by law. (Principal of Ethics 1J)" Additionally, Principal of Ethics 11 states that "Individuals shall not provide clinical services solely by correspondence." The answer to this question was "yes," it is ethical to offer a telehealth model of treatment provided it was not "solely by correspondence." As will be described in subsequent paragraphs, all assessments and the first two clinical sessions were conducted face-to-face as well as one other session.

Question 2: Was this family an appropriate candidate for a telehealth model of treatment? No decision is made in our clinic about the treatment model or method of service delivery until a complete assessment is completed. The assessment for the family in this report included a speech and language assessment of the child as well as a complete case history with the parents. It was the

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

decision of both the parents and professional staff that a telehealth model would be appropriate.

Question 3: Was appropriate technology available to conduct such a program? The equipment that was to be used was commercially available from numerous electronics outlets. A Logitech camera Model 8.3.0 was used and MSN Messenger v7.0 was the Internet messaging service. The family had an appropriate computer with high speed Internet and bandwidth capability, and the camera could be purchased without a financial burden. Both clinicians and the family had the same equipment at home so correspondence could be conducted on an as-needed basis.

Question 4: Did the clinicians have the proper experience and skills to conduct such a program? The clinical program was directed by the first author. He had prior experience with a telehealth model with a previous family that is described in this report. He was an ASHA certified member and a Board Recognized Specialist in Fluency Disorders with over 35 years of experience in stuttering therapy.

Question 5: How were the clinical contacts to be documented? Notes were taken each time a video conference was conducted. The length of the conference, detailed notes of what was discussed, and future assignments were documented for each session.

Question 6: How was the effectiveness of this program to be evaluated? Obviously, session-by-session evaluations could be conducted with each video conference just as it would be in a face-to-face situation. Formal evaluations were conducted face-to-face and included frequency counts of stuttering in conversation and reading as well as assessment reports from parents.

Question 7: Were there other models of telehealth service delivery that we might draw from? Research in the field of health services has shown that evaluation results, satisfaction reports, and general service delivery via telepractice can be equivalent to that which is provided face-to-face (American Speech-Language-Hearing Association, 2005b). Successful use of telepractice has been reported in delivery of services to rural areas (Houn & Trottier, 2003; Forducey, 2006), as well as with stuttering (Wilson, Onslow, & Lincoln, 2004), vocal rehabilitation (Mashima et al., 2003), audiology (Krumm, 2005), and assessment of motor speech disorders (Hill et al., 2006).

The positive answers to the above seven questions indicated that a telehealth model of treatment would be

appropriate to initiate with this family.

The first family in which a distance approach was utilized in our clinic lived in Orange, Texas--275 miles from San Marcos. A model of treatment was developed that included asynchronous telepractice (American Speech-Language-Hearing Association, 2005b) incorporating electronic mail, frequent telephone conferences, and an occasional video exchange. Results indicated that over a period of two years the child's stuttering was brought under control with seven face-to-face therapy sessions and 59 electronic correspondences (Mallard, 2002). A description of this family's progress is found at Mosheim (2004 a, b).

In the spring of 2004, the first author was contacted by a family in North Texas, more than 200 miles from San Marcos. It was reported by the mother that Stephen (not real name) had a severe stuttering disorder that had persisted over two years. This family was referred for stuttering therapy by the speech-language pathologist (SLP) that had previously worked with the child in the public school. Because of this SLP's self-described lack of specialized experience in stuttering, she referred the family to us for more specialized stuttering treatment. He received prior therapy both in the public schools for three months in kindergarten and in private therapy for seven months. The following describes the assessment and clinical procedures used with this family.

Procedure

Overall Objectives

Assessment and first assignment. The family was seen for an initial meeting in March of 2004. Stephen was 7 years of age and in the second grade. The purpose of the first meeting was to describe the model of therapy and the expected outcomes. A video was made of Stephen engaging in conversation and reading an age-appropriate passage. Results of the initial assessment are reported below.

The family was given a 3-week *Talk Time* assignment (Rustin, 1987; Rustin, Botterill, & Kelman, 1996). Each parent spent 5 minutes two times per week in a one-on-one conversation with Stephen. At the end of each *Talk Time*, parents recorded observations made during the session. At the end of each week, the form was mailed to the clinician. Feedback was provided to the parents each week. This assignment served two purposes. First, it established a pattern whereby the parents spent individual time with their child in a conversational setting. It was during *Talk Time* that clinical procedures were

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

practiced in the home environment. Second, the 3-week assignment allowed the clinician to determine how well the parents followed instructions. If the parents were not willing or unable to complete this first assignment, questions concerning the suitability of a home-based treatment program were probable. The family described here completed the assignment exactly as instructed.

A second assessment meeting was scheduled in order to obtain a thorough case history (Rustin, 1987; Rustin, Botterill, & Kelman, 1996). This meeting was conducted with the parents only. The case history used by Rustin and colleagues was used. The purpose of this interview was to determine the communication patterns in the home and to identify any issues in the child's communication environment that may need to be addressed in treatment. The case history did not reveal any issues that would preclude the family from participating in a distance-based clinical program.

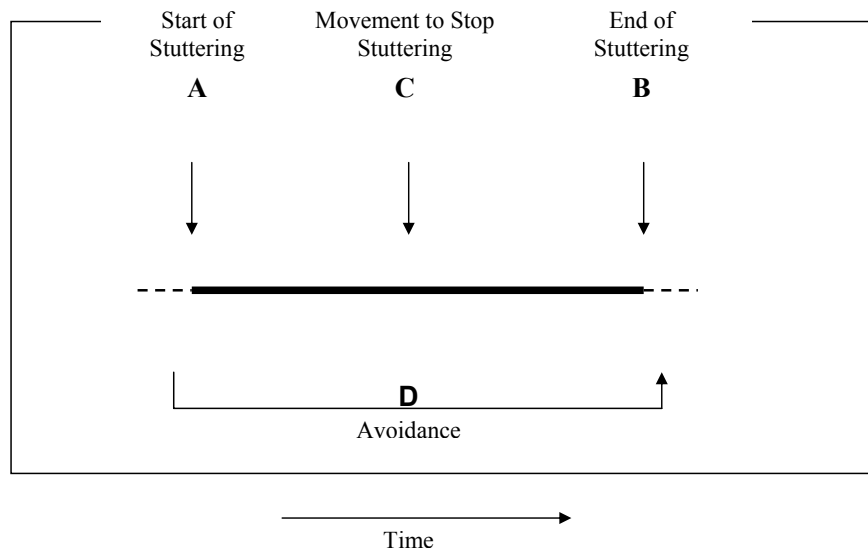
Clinical procedures-session one. The goals for the first session were threefold: (a) to explain the rationale on which the clinical procedures were based, (b) to teach the child and parents how to slow the movements in conversational speech, and (c) to discuss any situations in the child's communication environment that might need to be addressed. The first objective was to explain the rationale for speech change using a visual model of the sequence of events that take place during a

stuttering moment. This model was developed during earlier programs (Mallard, 1998b) in order to aid families in understanding how the stuttering moment was to be brought under control in treatment. Our experience suggested that individuals who had visual model that illustrated how stuttering was to be changed tended to transfer newly acquired speech skills easier than those who did not have such a visual representation.

The concept for this model came from Guyton (1976). He explained that voluntary motor movements are executed by the motor system following a stored sensory pattern called a *sensory engram*. When a person wishes to perform a purposeful act, "[the person] presumably calls forth one of these engrams and then sets the motor system of the brain into action to reproduce the sensory pattern that is laid down in the engram" (p. 171). Thus, to modify an involuntary movement like stuttering, one must first change the sensory engram to a more desired pattern. Our goal was to change the stuttering sequence from that of an uncontrolled motor movement on a word or sound to a movement sequence that the child could control.

Therapy model. Figure 1 depicts the sequence of events that take place in a stuttering moment. The thick horizontal line between A and B represents a moment of stuttering. This dysfluency may be preceded and followed by periods of fluent speech which are represented by dashed lines both before and after the stuttering moment. A is the

Figure 1. Sequence of events during moments of stuttering.



Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

moment that the stuttering begins and *B* in the end of stuttering. The distance from *A* to *B* represents the time it takes for stuttering to run its course without the person doing anything to stop the stuttering moment.

The notation *C* is used to represent the beginning of a movement (struggle behavior) that the person who stutters uses to stop stuttering. *C* is not a fixed point, but may vary in time relative to the beginning and end of stuttering. For example, *C* may occur after a period of time from the onset of stuttering as is illustrated in Figure 1. It is possible that *C* may occur in conjunction with the onset of stuttering. As stuttering severity increases, *C* may move before *A* when an individual anticipates having difficulty. Once the struggle behavior is initiated, the stuttering moment may end at that time or the struggling may continue until the block ends. The person who stutters may choose to avoid stuttering altogether by changing words and/or not speaking as illustrated by option *D*.

There were three objectives for treatment. The first objective was to produce a new engram for the stuttering moment in which Stephen did not struggle to stop stuttering. In order to control the stuttering moment, he had to stop engaging in *C* and/or *D*. This left a stuttering pattern that was free of tension (maintaining control of the muscles from *A* to *B*) and ending without movements that stop stuttering (*C* and/or *D*). When *C* and *D* were eliminated, it was then possible to gradually decrease the distance between *A* and *B*, thus reducing the duration of the stuttering moment. The second objective for treatment was to teach Stephen to slow his speech movements so he could learn to feel what each articulator was doing during talking. To accomplish this step, three "movement patterns" were identified. It was important to emphasize that we were not asking the child to simply talk slower. We emphasized *moving slower so you can feel what you are doing*.

Pattern 1 was characterized by very slow, exaggerated movements from one articulator position to the next while maintaining continuous voicing, normal loudness, and normal intonation. This movement pattern resulted in a speech rate of approximately 40-45 syllables per minute. This pattern produced total speech control in Stephen. If moments of stuttering occurred, Stephen would be encouraged to feel what was happening to the articulators during stuttering but not to stop the stuttering sequence. *Pattern 2* emphasized the same speech change concepts as *Pattern 1*, but the movements from one position to the next were somewhat faster. The target speech rate was approximately 80-85 syllables per minute. No

stuttering was observed with Stephen. He was able to produce this pattern easily and consistently with only a few suggestions from the clinicians. The ease of talking in the pattern 2 was a good prognostic sign for Stephen to change his manner of talking and monitor that change on his own. It has been our experience that this movement pattern normally produces fluent speech in almost all children who stutter that we have seen. *Pattern 3* was described as the "way you usually talk." No attempt was made to slow movements or to avoid stuttering. Stephen was encouraged to identify moments of stuttering and try and feel what was taking place during those moments. Nothing was done to try and modify stuttering during this pattern. *Pattern 3* was used mainly for comparison with patterns 1 and 2.

The third objective was to identify any situation in Stephen's communication environment that made talking difficult. It was revealed during the 3-week *Talk Time* assignment and the subsequent case history that the parents tended to ask Stephen frequent questions during their normal communication interactions. Stephen agreed that responding to direct questions was difficult, especially when he was busy or in a hurry. It was decided that the parents would refrain from asking direct questions as much as possible. Instead, they would seek information by making a declarative statement and waiting for him to respond when he was ready. For example, instead of asking, "How much homework do you have tonight?" they might say: "I see you brought home lots of books. You probably have a lot of homework." It was also mentioned that the four-year-old sister tended to interrupt and fill-in words for Stephen when he stuttered. These attempts to help caused Stephen to have increased difficulty talking.

The home assignment following the first session focused on two goals. First, Stephen was to practice talking in pattern 2 while keeping good eye contact throughout the entire *Talk Time*. The purpose of this assignment was to have him become accustomed to talking with control and monitoring speech movements. We wanted him to feel confident talking with pattern 2. He was to have a *Talk Time* two times a week for 5 minutes with each parent. While talking with pattern 2, he was to feel how his articulators were moving as he transitioned from one position to the next. Second, Stephen was to continue saying words he stuttered when his sister filled-in for him. He was not to allow her to alter what he wanted to say or how he was to say it.

The third and fourth assignments were for the parents. They were to allow Stephen to initiate most conversations for one week. For example, the parents were not going to

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

start asking him questions as soon as he came in from school. If they desired information from him, they were to make declarative statements as much as possible and allow him to supply the information as he wished. Finally, the parents were to observe Stephen's stuttering moments from the standpoint of the sequence of events model. They were to identify what he was doing during stuttering and when he tended to lose control relative to the initiation of stuttering. The first treatment session was conducted on August 28 and lasted for three hours. One telephone contact was made on September 26th and lasted for 15 minutes. The mother reported that all was going well with all four assignments. The next meeting was scheduled for October 2.

Clinical procedures-session two. The second session focused on the sequence of events model (Figure 1). The video made during the initial visit was played. Each stuttering moment was analyzed according to the sequence of events that took place. Struggle behaviors (Cs) were identified. The timing of the struggle behaviors in relation to the initiation of the stuttering moment was determined. In Stephen's case, he usually began his moments of stuttering with struggle. There appeared to be no avoidance during the video. His parents reported that it appeared he did not avoid in normal conversational situations. His eye contact was good throughout the stuttering sequence.

Stephen was asked to initiate moments of stuttering without using any Cs. In other words, he was asked to stutter without trying to stop the moment of stuttering. He was encouraged to let the stuttering block run its course and end by itself. He was able to accomplish this task on demand. He reported that it "felt good [to stutter] that way."

Web-camera addition. Given the family's distance from San Marcos, Stephen's success in changing his speech, and the success that the parents reported with all other assignments, the use of video conferencing using web-camera technology was described as a possible adjunct to treatment. The first author's experience with distance treatment was described (Mosheim, 2004b). The family was receptive to this option. It was explained that future face-to-face treatment sessions in San Marcos would be scheduled on an "as needed" basis. Clinical sessions would be conducted live via the web-camera whenever the need was present and at a convenient time for all concerned. Each clinician had the identical set-up. Web camera activities began after the second treatment session.

Stephen's program focused on identifying moments of stuttering and then eliminating struggle and avoidance (C and D in the model) by not moving through the stuttered sound until the block ended without struggle. These steps corresponded to the *identification* and *desensitization* procedures described by Van Riper (1973). The moments of stuttering actually increased in some instances when Stephen quit struggling and let the moments of stuttering run their course. This is a common experience early in treatment as the individual learns to stutter without struggling (Mallard, 1998a, b). As Stephen became proficient in eliminating struggle and avoidance and not struggling to end the stuttering moment, he was able to gain control of his speech musculature to move forward with control. Both parents became proficient in knowing what to look for and how to reinforce changed stuttering patterns.

Therapy sessions occurred in the home environment with the clinician monitoring progress via web-camera discussions on an as-needed basis. These meetings served to monitor the family's ability to implement speech change, to answer questions which arose during the week, and to troubleshoot newly encountered problems. Web meetings were conducted several times a week at the beginning and then tapered to once a week or less as the child gained proficiency. We used procedures outlined by Van Riper (1973) and Dell (1979) with Stephen, but other stuttering therapy approaches can be used as well in a distance approach, as illustrated by Wilson, Onslow, and Lincoln (2004). These authors used the Lidcombe Program (Onslow, Packman, & Harrison, 2003) as the treatment of choice and scheduled telephone consultations as the method of telehealth delivery. They concluded that a telehealth adaptation of the Lidcombe Program may be clinically viable and able to produce satisfactory clinical outcomes.

Results

As stated earlier, a speech analysis was conducted at the beginning of treatment. Another analysis was conducted for this report 14 months after treatment started. Stuttering was defined using Wingate's (1964) definition. A word was counted as stuttered if it contained prolongations and/or repetitions. Words were also counted as stuttered if they gave the appearance of speech-related struggle. Each pre- and post-tape was analyzed by both clinicians, and a word was counted as stuttered if both agreed.

Prior to treatment, Stephen stuttered on 35% of his words in conversation and 52% of words in reading with blocks lasting up to three seconds. He also exhibited severe

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

secondary features including head jerking, hand slapping, eye-blinking, phonating during inhalation, and attempting speech with an inadequate supply of air. Stephen's parents described his speech at that time as "very poor." They further stated that there were times when: "We couldn't even have a conversation with him because of the severity of his stuttering."

The current speech analysis revealed a reduction of stuttering and improved communication skills. In conversation, the percentage of words stuttered decreased from 35% to 19%. In reading, the percentage of stuttering was reduced from 52% to 22%. Stuttering moments lasted less than one second, most being described as *fleeting* (Riley, 1972). Struggle behaviors demonstrated at the beginning of treatment were eliminated or reduced to occasional use. Overall, the family attended two face-to-face meetings for assessment purposes and a total of three family-therapy sessions—each lasting an average of 2 hours. The third face-to-face session was conducted to introduce problem solving strategies described in detail by Rustin (1987). There have been 19 contacts made via video conferencing and telephone contact. Each contact lasted an average of 22 minutes. As of this writing, the total treatment time has been 14 months. We continue to monitor his progress on an as-needed basis. According to the parents and child and from observations from the clinician, there appears to be no need for future face-to-face meetings.

Discussion

A recent interview with the parents demonstrated the effects of the family therapy approach with the incorporation of video conferencing, as well as use of a graphical model to represent the moment of stuttering. The parents reported an increase in Stephen's willingness to communicate and an improvement in the quality of his communication. In addition, the parents stated they were confident in identifying secondary features and the rationale for reducing them by using the visual model. Finally, Stephen's confidence in communication with a wide variety of individuals increased as a result of treatment. Stephen's current speech was described by his parents as "much more controlled." They reported he is currently "working on a few lingering struggle behaviors, but he is much more confident when he is speaking to people outside his family." They further said: "He understands what he is doing [with his speech] and what he needs to do to have more control." His mother summarized his overall progress: "He is so much more talkative now, much more at ease and much more confident in his behaviors."

A parent critique of the video conference sessions revealed a positive satisfaction report. They described the use of videoconference as "an excellent way to keep in contact, especially for quick updates and to quickly address problems that arise during the week." When asked to evaluate the incorporation of the web-camera and its effect on the therapy process, the parents reported use of the web-camera as cost-effective by saving them travel and long distance phone expenses. They expressed the belief that several problems had been avoided because of the ability to address issues immediately using video-conferencing. They also indicated that use of web-conferencing improved the accessibility they had to their clinician. Regarding the graphical model used to represent stuttering, the parents expressed satisfaction with its use. They reported that it aided their ability to understand the dynamics of their child's stuttering and his targets for speech change.

There are numerous benefits that can be achieved when a telehealth model is adopted (American Speech-Language-Hearing Association, 2005c). The main benefit of telehealth for this family was that it provided access to specialized services that were not available where they resided. Recall that the family was referred to our clinic by the school-based speech-language pathologist because of her lack of experience in treating children who stutter. The lack of specialized training in stuttering has been noted by numerous authors and the most recent evidence is provided by Tellis (2007). His survey of 255 school speech-language pathologists in five states revealed that "Nearly half of those responding to the survey indicated they were 'not comfortable working with children who stutter'" (p. 5). Thus, telehealth procedures can provide opportunities for children and their families to receive specialized services that previously would not have been feasible.

The success of the two families mentioned in this article that we have treated via telehealth methodology point out the effectiveness of using this model of treatment. Traditional treatment regimes where the client and clinician meet face-to-face will continue to be the primary service delivery method in most clinical settings. Clinicians should not hesitate to adopt a distance approach to therapy where appropriate. We have found the telehealth model to produce comparable results in these two families as with families who we have seen in individual and intensive models of programming (Mallard, 1998b). The first author is presently conducting a pilot program in a public school setting where a family-based program is being used with all speech and language

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

problems, utilizing distance technology. The results are demonstrating a reduction in the school case load plus a more efficient model of treatment than the traditional pull-out model. The efficiency of working through the family where the child does not have to be pulled from class is showing promising results.

Although this report demonstrates the successful use of telepractice in stuttering therapy, it is important to stress that this procedure may not be for everyone or every family. A thorough case history and assessment such as that used by Rustin, Bottrill, and Kelman (1996) is critical to determine if the client and/or family are good candidates for a family-based treatment approach. In addition, certain knowledge and skills are required for the provision of quality telepractice service (American Speech-Language-Hearing Association, 2005a, 2005b, 2005c). Families must be able to provide support resources such as a personal computer, video camera, and broadband Internet connection with bandwidths necessary to supply quality signals. Both parents and children must be able to follow instructions provided by the clinician in order to implement speech change.

The results of this family demonstrate that the family-based approach to stuttering intervention (Rustin, 1987b; Mallard, 1998b; Mallard, 2002) continues to be a powerful therapy design. Changes in speech control, as well as changes in attitude toward speech, illustrate the effectiveness of employing the family in the management of speech-change using a distance-treatment model.

Acknowledgment

We acknowledge the late Lena Rustin for the contributions she made during her lifetime that have influenced families and speech-language pathologists internationally. We also thank her colleagues at the Michael Palin Centre for Stammering Children in London, England for their contributions to the family management of stuttering model used in this study. We express our appreciation to the family described in this report that participated so enthusiastically and allowed us to use them for this experimental procedure. Please send correspondence concerning this article to Dr. Richard Mallard, dmallard@austin.rr.com.

References

- American Speech-Language-Hearing Association. (2003). Code of ethics (revised). *ASHA Supplement*, 23, pp. 13-15. Retrieved May 18, 2007, from <http://www.asha.org/NR/rdonlyres/F51E46C5-3D87-44AF-BFDA-346D32F85C60/0/v1CodeOfEthics.pdf>
- American Speech-Language-Hearing Association. (2005a). *Speech-Language pathologists providing clinical services via telepractice: Position statement*. Retrieved June 25, 2007, from www.asha.org/policy
- American Speech-Language-Hearing Association. (2005b). Knowledge and skills needed by speech-language pathologists providing clinical services via telepractice. Retrieved May 18, 2007, from <http://www.asha.org/members/deskref-journals/deskref/default>
- American Speech-Language-Hearing Association. (2005c). *Speech-Language pathologists providing clinical services via telepractice [Technical Report]*. Retrieved June 25, 2007, from www.asha.org/policy
- Dell, C. (1979). *Stuttering Therapy: A Guide for Clinicians*. Memphis, TN: Stuttering Foundation of America.
- Forducey, P. G. (2006, August). Speech telepractice program expands options for rural Oklahoma schools. *The ASHA Leader*, 11, 12-13.
- Guyton, A. C. (1976). *Structure and Function of the Nervous System*. Philadelphia: W. B. Saunders.
- Hill, A. J., Theodoros, D. G., Russell, T. G., Cahill, L. M., Ward, E. G., & Clark, K. M. (2006). An internet-based telerehabilitation system for the assessment of motor speech disorders: A pilot study. *American Journal of Speech-Language Pathology*, 15, 45-56.
- Houn, B., & Trottier, K. (2003, November). Meeting the challenge of rural service delivery. *The ASHA Leader*, 7, 2, 15.
- Krumm, M. (2005, November). Audiology telepractice moves from theory to treatment. *The ASHA Leader*, 10, 22-23.
- Mallard, A.R., (1998a). Encouraging a broader perspective in judging the effectiveness of stuttering therapy. *Journal of Fluency Disorders*, 23, 123-126.

Clinical Forum

Using Web-Camera Technology in the Family Management of Stuttering: A Case Study

A. Richard Mallard, Private Practice-San Marcos and Jill K. Green, University of Texas Health Science Center-San Antonio

- Mallard, A. R. (1998b). Using problem-solving procedures in family management of stuttering. *Journal of Fluency Disorders*, 23, 127-135.
- Mallard, A.R. (2002, June). Expanding family intervention in stuttering through electronic media. Paper presented at the Sixth Oxford Dysfluency Conference, Oxford University, Oxford, England.
- Mashima, P. A., Birkmire-Peters, D. P., Syms, M. J., Holtel, M. R., Lawrence, P. A., Burgess, L. P. A., et al. (2003). Telehealth: Voice therapy using telecommunications technology. *American Journal of Speech-Language Pathology*, 12, 432-439.
- Mosheim, J. (2004a, May). Online support for stuttering therapy. *Advance for Speech-Language Pathologists & Audiologists*, 10, 11-12, 19.
- Mosheim, J. (2004b). Success in online therapy. *Advance for Speech-Language Pathologists & Audiologists*. Retrieved May 18, 2007, from www.advanceforspanda.com/common/editorial/editorial.aspx?cc=34940
- Onslow, M., Packman, A., & Harrison, E. (2003). *The Lidcombe program of early stuttering intervention: A clinician's guide*. Austin, TX: Pro-Ed.
- Riley, G. D., (1972). A stuttering severity instrument for children and adults. *Journal of Speech and Hearing Disorders*, 37, 314-322.
- Rustin, L. (1987). *Assessment and therapy programme for dysfluent children*. Tempe, AZ: Communication Skill Builders.
- Rustin, L., Botterill, W., & Kelman, E. (1996). *Assessment and therapy for young disfluent children*. London: Whurr Publishers.
- Tellis, G. (2007). Alarming statistics show training urgently needed. *The Stuttering Foundation, Summer*, 5.
- Van Riper, C. (1973). *The Treatment of Stuttering*. Englewood-Cliffs, NJ: Prentice-Hall.
- Wilson, L., Onslow, M., & Lincoln, M. (2004). Telehealth: Adaptation of the Lidcombe Program of Early Stuttering Intervention: Five case studies. *American Journal of Speech-Language Pathology*, 13, 81-93.
- Wingate, M. (1964). A standard definition of stuttering. *Journal of Speech and Hearing Disorders*, 29, 484-488.



Speech-Language & Hearing Sciences
Speech Language & Hearing Clinic
3601 4th Street, Suite 2A300
Lubbock, Texas 79430-6073
T 806.743.5678 | F 806.743.5674



**COMMUNICATION
SCIENCES AND
DISORDERS**

Knowledge is knowing the street is one-way;
research is looking both directions anyway.
www.uh.edu/comd