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Farewell to OSLHA Publications from an Old Hand

After six years as OSLHA’s Director of Technology and Publications and more than 15 years as Associate Editor and Editor of the print version of HEARSAY, I want to say thanks to our readers and to all of the volunteers who spent endless hours working to ensure that OSLHA continues to be the only state association with a regularly published journal. I need to mention especially Monica Gordon Pershey who served as my Associate Editor for many years and is now the eHearsay journal Editor, along with Kate Krival, Associate Editor, who both worked at top speed to publish our second electronic issue. My continuing thanks to Nancy and Chelsea Bailey, who worked with me to upgrade the OSLHA website and to all the guest editors, authors, and reviewers who volunteered their time to contribute to our publications.

Special thanks also to Stacy Williams who has served as the web master through all of my terms, to Crysten Skebo who has managed the OSLHA Facebook page, and to all the officers of OSLHA who have supported and urged me on in the area of publications. Finally, thanks to Jody Johnson, Maineville, Ohio’s finest, who has served as Production Editor from the print versions of HEARSAY in the late 90s to the present electronic versions. You all are the best.

Having achieved life membership in OSLHA, it’s time to turn my attention to a new phase in my life, to new experiences, and to learning new things about people, animals, and the world. Good luck to Davy Weaver, the new Director of Technology and Publications, and to OSLHA as it faces change and new challenges.

Laura Kretschmer
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This issue focuses on telepractice, which entails the use of telecommunications technologies to link clinicians and clients at a distance. The American Speech-Language-Hearing Association (ASHA, 2005) approves telepractice for diagnosis, therapy, and case management.

The topic of telepractice is particularly relevant given the increasing availability of user-friendly telecommunications technologies. However, with this growth come emerging controversies associated with telepractice. Many clinicians, administrators, and consumers harbor a healthy skepticism. Some may feel that telepractice is a depersonalized form of interaction, one of the many types of “virtual” human contact that could threaten to supplant person-to-person interaction. Moreover, considering that the rationale for choosing telepractice may sometimes have to do with cost savings – reducing the number of personnel hired or maximizing use of staff time – and with the practical convenience of minimizing consumers’ travel time and expenses, telepractice could receive some criticism as a model of service delivery that is driven by “the bottom line.”

While these concerns are real, the most important considerations for the professions of speech-language pathology and audiology pertain to whether telepractice can effectively serve persons with communication disorders. Telepractice can provide greater access to services for those who live at a distance from service sites or who have difficulty with mobility or travel. Presently, in order to determine when, where, and how telepractice provides effective practice, research is being conducted, practical evidence is being gathered, and consumer outcome benefits are being documented. These findings can inform the decisions that professionals and consumers will make regarding the efficacy of telepractice. The intent of this issue is to provide some information on how telepractice has been used in a variety of settings and thus share some of the available evidence.

This issue offers a variety of articles that discuss telepractice. Included in the Research Forum is a study of the outcomes of a web-based, self-guided, at-home intervention program for veterans with traumatic brain injury. The Clinic Forum features two reports on telepractice, one on services for young children and their families and one on voice therapy. The Hearing is Believing column offers a review of studies on audiology telehealth. Clinical Grand Rounds provides an account of a hybrid intervention program to treat stuttering using traditional clinical services coupled with follow-up therapy via telepractice. The University Forum paper describes a telepractice intervention program for school-age children that functions as a training site for student clinicians.

Branching out from telepractice, the Getting Down to Business article discusses how the
Internet provides speech-language pathologists and audiologists with innumerable opportunities for connecting with other individuals. The authors provide practical strategies for maximizing the benefits of online tools and social media. The Research Forum offers an off-theme paper on second language learning among bilingual Spanish-English children.

This issue of eHearsay leaves us with many unexplored questions, for example, what types of staff training can prepare practitioners to provide services via telepractice? How will a telepractice clinician’s job performance be evaluated? What articles, books, or electronic sources on telepractice are destined to become the staples of university courses? Will standard procedures or customary models of service delivery emerge? Will landmark case studies be documented and inform practice? What new tools will emerge to judge the effectiveness of service delivery? Will there be systematic evaluations of the quality of telepractice services, and what criteria will they use? Will anecdotal evidence disseminated via social media become a relevant source of information for consumers? Even the vocabulary of telepractice is evolving – because telepractice can provide synchronous video interactions between persons at remote sites, it can be considered “face-to-face.” That leaves us with a need for new terms to describe traditional services – perhaps “side by side” or “on site.” The contrast is between “within proximity” and “out of proximity.” On a practical level, issues of licensure across states, reimbursement, hiring and employment practices, risk management, HIPAA compliance, confidentiality, and professional ethics will need to be addressed.

Further information can be obtained online from ASHA’s Knowledge and Skills document on telepractice. ASHA Special Interest Group 18, Telepractice, publishes a Perspectives newsletter devoted entirely to telepractice in speech-language pathology and audiology. Other multidisciplinary sources include the American Telemedicine Association, the International Journal of Telerehabilitation, and the International Journal of Telemedicine and Telecare.

Acknowledgments

Peer reviewers are essential to the eHearsay publication process. These reviewers offered generous assistance in evaluating manuscripts to insure the quality scholarship: Donna Edwards, Lori Pakulski, Richard R. Kretschmer, Wayne Secord, and Laurie Sheehy. We thank them for their perceptive analyses.

Reading eHearsay and completing CEU questions is an ASHA-approved professional development opportunity for all OSLHA members. Grateful thanks are extended to Volume 2 CEU reviewers Donna Edwards, Sue Grogan-Johnson, Richard R. Kretschmer, Lori Pakulski, Laurie Sheehy, Susan Waizenhofer, and Lindsay Zombek. We sincerely appreciate their prompt and thoughtful responses. All articles and papers underwent editorial review by Robin Alvares, Monica Gordon Pershey, Kate Krival, and Laura W. Kretschmer. The eHearsay Editorial Review Board includes John Clark, Laura W. Kretschmer, Jo-Anne Prendeville, and Wayne Secord.

Special thanks to eHearsay Associate Editor Kate Krival for monitoring the eHearsay blog comments page and for administering the CEU process. Questions about how to obtain CEUs can be addressed to Chelsea Bailey at OSLHA-Chelsea@ohioslha.org. Our thanks to Kate’s student assistant, Hayley Bennett, who proofread and formatted manuscripts. We express our gratitude to the OSLHA staff, Nancy Bailey and Chelsea Bailey, for having expertly mounted Volume 1 of eHearsay and its supporting web pages on the
OSLHA site and for graciously handling the endless details that accompany the publication of this e-journal. We thank OSLHA president Janice Wright for her encouragement; incoming Director of Technology and Publications Davida Weaver for her patience; and production manager Jody E. Johnson for her creativity and careful work. Our heartfelt appreciation is extended to Laura W. Kretschmer, outgoing Director of Technology and Publications, for her dedication, generosity, insight, and skill. In the Volume 1 acknowledgements we said, “Without Laura, this issue would not have come to be.” This remains true for Volume 2. She is as close to a guardian angel as any of us are going to see.


2. eHearsay publishes annual themed issues each summer, online only, at http://www.ohioslha.org

3. eHearsay publishes invited and submitted papers. All papers undergo peer and editorial review.

4. Papers must be submitted as WORD (.doc) files, with supporting documents as .pdf, .ppt, or .jpg files. Images need to be provided as print quality resolution (300dpi). Submissions must follow the guidelines for style published by the American Psychological Association (APA) (6th Edition, 2010).

5. Authors transfer copyright to OSLHA. eHearsay prefers to publish previously unpublished material. Any previously published content must be accompanied by written permission granted by the original source.

6. Papers may be submitted at any time to Laurie.Sheehy@utoledo.edu or to Guest Editors listed on the Call for Submissions. Papers submitted after December 1 may not appear in the subsequent summer issue.
Abstract

Objective: To report the feasibility, user satisfaction, and preliminary efficacy of TBI Telehealth, a web-based pilot treatment program designed to improve cognitive, behavioral, and social sequelae following mild traumatic brain injury (TBI). Methods: Eight veterans of Operation Enduring Freedom and/or Operation Iraqi Freedom (OEF/OIF) with mild TBI completed assessments before and after a four-session, four-week web-based cognitive intervention, TBI Telehealth, designed to increase their knowledge of the common consequences of mild TBI and to enhance problem-solving and adjustment. Each session consisted of didactic information, video clips, and self-guided web exercises. Results: Pre-post t-tests showed significant improvement on memory testing for all verbal subtests and in TBI knowledge. Participants reported that they benefited from the program, although two indicated a preference for traditional hospital-based treatment. Conclusions: Results provide preliminary evidence that TBI Telehealth is feasible. Further testing using a control group could distinguish treatment from practice effects.

Keywords: telehealth, acquired brain injury, intervention, problem solving, online, cognition

Learning Objectives

1. Learners will identify pre-post measures of improvement in cognitive skills following a web-based mode of treatment.
2. Learners will describe how speech-language pathologists might use web based intervention to provide cognitive treatment to veterans with mild TBI.
3. Learners will state one barrier to utilizing telepractice for cognitive intervention.

Between January 2003 and September 2009, 63,856 service men and women have received a diagnosis of traumatic brain injury (TBI) (United States Department of Defense, 2009). TBI contributes to cognitive impairment, including deficits in planning, problem solving skills, memory, attention, and communication (Belanger, Kretzmer, Yoash-Gantz, Pickett, & Tupler, 2009; Lew et al., 2008). Underlying post-traumatic stress disorder (PTSD) and depressive symptoms complicate the diagnosis and treatment of TBI in this population and impede recovery (Hoge, Aucinterlonie, & Milliken, 2006; Wade, Carey, & Wolfe, 2006).

Although programs are in place to screen all returning military personnel for TBI and PTSD, between 40-60% of military personnel referred for mental health treatment fail to obtain screening (Hoge et al., 2006). Often the demands of work and family hinder veterans’ ability to seek treatment through the Veteran’s Affairs Medical Centers (VAMC) across the U. S. Online or web-based approaches may provide a viable means for reducing barriers to treatment, such as time, distance, and stigma. Moreover, increasing evidence suggests that online or computer-based treatments can be successful in improving cognitive and behavioral outcomes following TBI (Millikin, Aucinterlonie, & Hoge, 2007; Nelson & Haley, 2006; Wade, Walz, Carey, & Williams, 2009).

Recent research with veterans provides further support for online treatments to address the consequences of TBI in the military. Nelson and Haley (2006) developed a prototype web-based
treatment for individuals with mild TBI. Their website provided online education to reduce frequency and severity of post-concussion symptoms. Twelve participants with mild TBI completed a pilot program and rated the prototype as useful and interactive, with most indicating that they would use the website for therapeutic purposes if it were available (Millikin et al., 2007).

Services Provided via Telemedicine

Telemedicine is defined as the use of telecommunications technologies to provide medical information and services (Perednia & Allen, 1995). Health care providers, including doctors, nurses, clinicians, and administrators, have been using telephones and computers to improve the quality and ease of patient access to care since the early 1990s (Lehous, Sicotte, Denis, Berg, & Lacroix, 2002). Telemedicine has been utilized in a number of medical specialties, including radiology, dermatology, oncology, cardiology, surgery, psychiatry, psychology, and rehabilitation, including speech-language pathology. For example, to improve the accessibility to speech-language pathology services, Mashima et al. (2003) used real-time audio-video monitoring equipment to provide voice therapy for veterans in Hawaii, Japan, and Korea. Tindall, Huebner, Stemple, and Kleinert (2008) used Televyou TV 500SP videophones to provide Lee Silverman Voice Therapy (LSVT®) (as described by Ramig, Bonitati, Lemke, & Horii, 1994) to 22 males and two females with idiopathic Parkinson's disease (IPD) (mean age 70.5). The targeted outcome was post-treatment improvement in vocal intensity. The results showed a statistically significant increase in decibel (dB) levels for the LSVT videophone treatment group. Participants were surveyed on their level of satisfaction with the telepractice mode of treatment, including their experience with the videophone equipment. Results showed average to very strong agreement on all questions regarding satisfaction with the model of treatment, including the videophone equipment.

Traumatic Brain Injury and Telemedicine

Egan, Worrall, and Oxenham (2004) investigated whether individuals with cognitive-linguistic impairment as a result of TBI could use the Internet. Seven patients with brain injury and confirmed cognitive impairments were able to learn Internet skills with the aid of specialized training materials. Study participants were trained to use the Internet using an already researched protocol designed for persons with aphasia. The intervention attempted to reduce training barriers, including impairments in sequencing, sustained attention, divided attention, and memory skills. Despite participants’ deficits in information processing, divided attention, and alternating between tasks, they were able to follow the sequential steps outlined in the therapy module with success. Only one participant out of seven was unable to complete the program, due to severe memory impairment. Positive outcomes provide support for the utilization of web-based treatment for persons with cognitive deficits. The Egan, Worrall, and Oxenham (2004) model’s flexibility and its potential to enhance compliance matched some of the needs of the sample under study.

Telemedicine within the VAMC

According to Godleski, Nieves, Darkins, and Lehmann (2008), the Veterans Health Administration (VHA) is among the largest integrated healthcare systems in the world and is the largest within the U. S. Telemedicine has begun to play a large part in therapeutic interventions provided by the Department of Veterans Affairs (VA) (Girard, 2007). VHA began using videoconference phones in 2007 to connect directly into patients’ homes. VHA telemedicine programs have reduced hospitalization, length of stay, and emergency room visits, while improving the quality of life for veterans (Darkins, 2006).
The Current Study

This report presents preliminary efficacy data for a web-based problem-solving treatment program for veterans of OEF/OIF with cognitive complaints. The current intervention was based on an intervention developed by Wade et al. (2009) titled Teen Online Problem Solving Intervention (TOPS). The TOPS intervention emphasized development and/or remediation of executive function skills, including self-awareness, self-regulation, social competence, planning, and problem-solving, in adolescent survivors of TBI. TOPS intervention incorporated training in pragmatics and social information processing in order to address deficits in social competence. The intervention was delivered online to minimize barriers to care and to increase engagement. The Wade et al. pilot study differed from Nelson and Haley’s (2006) in that the focus of the Wade et al. intervention was to provide actual training in skills to improve executive function deficits, while the Nelson and Haley study targeted improving education to reduce post concussive symptomatology.

The goals of the current study were to adapt TOPS to address the needs of veterans and to examine its feasibility and preliminary efficacy in a small trial. Based on preliminary experience and our literature review, we anticipated that the intervention would be well received and would result in improvements in TBI knowledge and executive function skills. The specific objectives for this study were as follows:

1. To determine if the intervention modules were easy to use and perceived as useful.
2. To determine if completion of the modules resulted in an increase in knowledge of TBI.
3. To determine if completion of the modules resulted in improvements in memory from pre-treatment to follow-up.

Methods

Procedures

The study was approved by the Institutional Review Boards of the participating VHA hospital and an associated university. The first author, a licensed doctoral-level speech-language pathologist (SLP) who has experience treating veterans with TBI and extensive training in interviewing techniques, testing, and questionnaire administration, determined participants’ eligibility, obtained informed consent from all participants, constructed all of the non-standardized measures, and conducted all testing, interviewing, and participant training.

Standardized cognitive assessments of memory and attention were administered pre-post intervention. Pre-intervention assessments included the Test of Memory and Learning, 2nd Edition (TOMAL-2) (Reynolds & Voress, 2007) and the Test of Everyday Attention (TEA) (Robertson, Ward, Ridgeway, & Nimmo-Smith, 1994). The Peabody Picture Vocabulary Test-Third Edition (PPVT-III) (Dunn & Dunn, 1997), the State-Trait Anxiety Inventory (STAI) (Spielberg, 2005) and a clinician-constructed questionnaire assessing baseline TBI knowledge were also administered. The TOMAL-2 and the TBI questionnaire were given post-intervention for comparison. Results for the TEA were not analyzed or reported due to an error in administration at post-testing which precluded their use.

The SLP provided participants with training that entailed a live demonstration on how to access the modules on the website. Participants were required to demonstrate the ability to independently access the website prior to leaving the pre-testing session. All participants received identical website content.

Upon completion of the intervention, the participants completed a clinician-constructed satisfaction survey and a semi-structured interview.
**Participants**

Participants were recruited from the Cincinnati VAMC Speech Traumatic Brain Injury Clinics. To be eligible, participants had to be between the ages of 20-43 and have a diagnosis of post-concussive syndrome as established by a nurse practitioner or physiatrist within the Traumatic Brain Injury Clinic. Participants had to have independent access to a computer and the Internet.

Twelve male participants signed an informed consent form and agreed to participate; eight completed the intervention (67%). Of the four who left the study, two participants dropped out prior to baseline testing; one remained interested in continuing the intervention but moved away and was unable to access the Internet; and one completed pre-intervention testing but did not complete the intervention due to school and family constraints. The eight participants who completed the intervention were an average of 31.38 years old (range 22 to 43 years). The time between injury and study enrollment was impossible to determine given the high incidence of multiple blast exposures, lack of documentation of injury, and the participants’ inability to recall specific dates.

Four of the participants were married, two were single, and two were divorced. Half had a high school diploma or equivalent and half had some college experience. Estimated pre-morbid level of verbal intelligence obtained via PPVT-III standard scores ranged from 85-131. All but one participant scored at or above the low average range, with two scoring two or more standard deviations above the mean. The individual who earned a score of 85 subsequently reported baseline reading impairment requiring a high school Individualized Educational Plan for remedial math and reading.

**Instrumentation**

**Assessment of memory function.** The TOMAL-2 includes eight core subtests, six supplementary subtests, and two delayed recall tasks. For the purposes of this intervention, only the eight core subtests were administered. The core battery yields three core index scores: verbal, non-verbal, and composite memory. Specific core subtests include memory for stories, facial memory, word selective reminding, abstract visual memory, object recall, visual sequential memory, paired recall, and memory for location. The TOMAL-2 was chosen because of its established reliability and validity, relative brevity, and ease of administration. Improvement in memory post-intervention was anticipated, given the intervention's emphasis on strategies to improve attitude and gain control over stressful situations (with stress suspected to contribute to memory deficits in high-stakes situations such as testing). Thus, if the participants were able to improve their ability to handle the stress associated with test-taking and to maintain a positive attitude about the test, scores should improve in the absence of rote drill and practice.

**Assessment of verbal IQ.** The PPVT-III is a measure of receptive vocabulary and a screening test of verbal intelligence. National norms extend through age 90+ years. Verbal intelligence has shown to be an excellent predictor of pre-injury intelligence (Lezak, Howieson, Loring, 2004). The PPVT-III was selected to obtain verbal intelligence scores in the absence of pre-injury IQ information.

**Anxiety assessment.** The STAI is a self-report measure of both state (transient) and trait (long-lasting or habitual) anxiety. The STAI was administered pre-intervention to obtain a current level and a general level of anxiety in each participant. Trait anxiety (T-anxiety) refers to proneness to anxiety, that is, the tendency to perceive stressful situation as dangerous or threatening and to respond with elevation of the intensity of state anxiety (S-Anxiety) reactions. Norms are available for male and female high school students, college students, and military recruits across three age groups, 19-39, 40-49, and 50-69. Pearson $r$ correlations were run post-treatment to identify the relationship.
between pre-treatment anxiety and improvement in memory between pre-post interventions.

**TBI knowledge questionnaire.** The first author developed the questionnaire to assess common misconceptions about TBI and to pre-screen for knowledge of the information that was to be presented in the treatment modules. Twenty true/false and multiple choice questions assessed veterans’ levels of knowledge about the consequences of TBI, both before and after the TBI Telehealth program. Example questions are “True or False: Problem solving skills become more important after a brain injury”; “Which of the following is a physical clue to anger? a) Muscle tensing, b) Increase in heart rate, c) Inability to concentrate, d) Both A and B, e) All of the above.”

**Post-treatment qualitative interview.** Post-treatment, each veteran completed a semi-structured interview regarding his experiences with the program. Questions covered expectations for the program, feelings about the technology, and how this experience compared to other treatments they had received for their TBI. Specific probes queried about the web materials, problem solving processes taught, and information about TBI. Thematic analysis was used to identify common issues and themes raised by the veterans.

**Post-treatment satisfaction survey.** The first author developed the satisfaction survey based on a satisfaction survey developed by Wade et al., (2009). Items pertain to participants’ satisfaction with the mode of treatment, the specific skill training, and the desire to continue either computer-based or face-to-face therapy. Participants’ responses to these items could range from strongly disagree to strongly agree.

**Description of the Intervention**

The TBI Telehealth content was designed to target the executive and social skills that are essential for successful adult functioning, such as attention, memory, and concentration. Four intervention modules focused on training metacognitive strategies rather than improving executive dysfunction through drill practices. The content and graphics of four selected sessions of the 16-session TOPS program (Wade et al., 2009) were modified to be age- and issue-appropriate for the veteran population. Given a lack of funding to develop new videos, the original TOPS video clips of adolescents were used. Intervention was conducted from a speech-language therapy standpoint, not to address the many psychological concerns reported by returning veterans. Thus, the intervention was not intended to meet the patients’ need for psychotherapy. Behavioral issues targeted were related to pragmatics, as is within the scope of practice for SLPs. Specific modules included information on the pragmatics of interpersonal communication, nonverbal communication, social problem-solving and social skills training.

The TBI Telehealth website homepage, housed on the Cincinnati Children’s Medical Center server, featured a log-in requiring a standard username and password. For ease of implementation, all participants used the same phrase as both the username and password. By clicking on a “Start Sessions” button, participants could access the self-guided content of current and previous sessions.

The initial session, “Controlling your Behavior,” placed emphasis on the participant monitoring and changing his behavior. The second session, “Getting Organized,” focused on organizational strategies to reduce extraneous stress and minimize problems at work, home, or school. Specific strategies to improve attention and memory were discussed. The third session, “Staying in Control,” outlined ways to control emotions and behavior, including education on the identification and management of PTSD. The content focused on planning for success using a self monitoring mnemonic, SMART (Stop Monitor Appraise Reflect Try). Module number four, “Staying Positive,” highlighted common concerns and problems that veterans may face following a brain injury, including strategies to improve their attitude, to work toward solutions, and to communicate with others.
The anticipated timeframe from initial cognitive assessment to post-intervention testing was four weeks. Mean duration of intervention was 52.13 days (more than seven weeks). Two participants required extended time to complete the modules due to deployment and family issues, completing the intervention in 17 weeks and 9.5 weeks, respectively.

**Statistical Procedures**
Statistical analyses included pre-post t-tests comparing scores for the TOMAL-2 and TBI knowledge questionnaire. Descriptive analyses were conducted to characterize the sample and examine the STAI and satisfaction measures. Pearson $r$ correlations were conducted to examine the relationship between the continuous variables of pre-treatment anxiety and pre-post improvement in TOMAL scores.

**Results**

**Feasibility**
Technical difficulties were minimal. On two occasions, participants lost their login information. In both cases, this problem was addressed with a follow-up phone call to ensure ease of use and successful login.

**Improvements in Memory**
As reported in Table 1, t-tests comparing pre-post intervention showed significant improvement on the TOMAL-2 for all verbal subtests, with a correspondingly large effect sizes (Cohen’s $D$ greater than .5). Mean pre-intervention scores for the TOMAL were lower than that of the standardization cohort. Post intervention mean scores were consistent with the standardization sample for most subtests. On two subtests, Paired Recall and Object Recall, the group had mean 5- and 4-point increases, respectively, suggesting more substantial improvement in these domains. These findings lend tentative support to the hypothesis that they may have employed additional association strategies post-intervention to improve recall.

**Satisfaction**
Survey response data are given in Table 2. Participants reported that they benefited from the program. Four of the eight veterans answered “Yes” when asked if they liked working from a

<table>
<thead>
<tr>
<th>Subtest</th>
<th>M</th>
<th>SD</th>
<th>M</th>
<th>SD</th>
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<th>df</th>
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<td>8.75</td>
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<tr>
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<td>8.125</td>
<td>3.482</td>
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<td>1.669</td>
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Note: MFS=Memory for Stories; WSR=Word Selective Reminding; OR=Object Recall; PR=Paired Recall; FM=Facial Memory; AVM=Abstract Visual Memory; VSM=Visual Sequential Memory; MFL=Memory for Location

Table 1. Pre-Post Test of Memory and Learning
computer. Similarly, seven out of eight reported that they were somewhat or very satisfied when asked, “Do you think this program provided useful organizational strategies?” Interestingly, two participants reported they would have preferred face-to-face intervention; four were unsure of a preference, and two stated they preferred computer-based therapy. One person indicated high overall satisfaction; three reported that they were satisfied; and three indicated that they were neither satisfied nor dissatisfied; one person did not answer the question. When asked if the participants would continue in further cognitive therapy through computer-based training from home, four participants said yes, one was unsure, one indicated he would prefer to come to the VA for face to face therapy, and one said he would not participate in computer-based training from home. Both participants who did not wish to continue computer-based training had young children at home and felt their improvement would be greater if therapy were done at the hospital.

Interview feedback provided insight regarding potential sources of dissatisfaction and areas for improvement. Common themes included a desire for an interactive component as well as a request for a voice over and the inclusion of veterans, rather than adolescents, as video models talking about the problems associated with TBI.

**Improvement in TBI Knowledge**

Results for the pre-post t-tests of TBI knowledge showed statistically significant improvement in overall knowledge, $t(7)=2.6; p=.04$; df=7 and a large effect size ($d=.91$). Common baseline misconceptions included limited understanding of TBI symptomatology, manifestations, and useful coping mechanisms. Participants also failed to identify useful strategies for improving executive function deficits on baseline testing. Post-intervention scores revealed an improvement in the identification of appropriate coping and compensatory strategies. In addition, the relationship between PTSD and TBI was not

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**Table 2. Participant response to satisfaction questionnaire**

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>Sometimes</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you like working from a computer?</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>37.5</td>
</tr>
<tr>
<td>Do you think this program provided useful organizational strategies?</td>
<td>Very Satisfied</td>
<td>4</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Would you have preferred face to face intervention versus home-based computer therapy?</td>
<td>Yes</td>
<td>2</td>
<td>25.0</td>
<td></td>
</tr>
<tr>
<td>Would you participate in further cognitive therapy through computer-based training from home?</td>
<td>Yes</td>
<td>4</td>
<td>57.1</td>
<td></td>
</tr>
<tr>
<td>Overall satisfaction with computer-based therapy program</td>
<td>Very satisfied</td>
<td>1</td>
<td>14.3</td>
<td></td>
</tr>
<tr>
<td>I would like to continue face to face cognitive therapy at CVAMC</td>
<td>Yes</td>
<td>5</td>
<td>71.4</td>
<td></td>
</tr>
</tbody>
</table>

---

Note: The table above summarizes participant responses to various questions related to their satisfaction with the computer-based therapy program.
well understood at baseline. Post-intervention scores revealed an increased understanding of the association between PTSD and TBI.

**Associations between Pre-Treatment Anxiety and Memory**

Pre-intervention assessment of anxiety was variable between participants. Both state and trait anxiety scores at pre-treatment ranged broadly: the range in state anxiety was 34 to 55 and range in trait anxiety was 36 to 55, indicating substantial variability in levels of anxiety between participants. Participants in the study had a lower mean of state anxiety ($m=40.13$) compared to the military recruit normative sample ($m=44.05$). Although average levels of trait anxiety in the current sample ($m=45.88$) were slightly greater than normative ($m=37.64$) samples, no one in the present study was greater than one standard deviation above the normative sample's indicators of clinically elevated levels of anxiety. Correlations between state anxiety scores and TOMAL subtests ranged from -.48 for paired recall to .49 for abstract visual memory. The correlations between trait anxiety and TOMAL subtest scores ranged from -.74 for facial memory to .58 for abstract visual memory. None of these correlations reached the level of statistical significance, perhaps related to the small sample size. However, significant correlations were identified between anxiety at baseline and improvement in memory between pre- and post-intervention. Results indicated that participants with a high level of baseline state anxiety had statistically significant improvement in the paired recall subtest of the TOMAL ($r=.80; p=.02$).

**Discussion**

The present study reports the preliminary findings of an innovative web-based treatment approach to improving executive function skills following mild TBI in returning veterans. The results support the feasibility of the approach, although satisfaction with the intervention approach and content varied. The results provide preliminary evidence of efficacy in improving knowledge and memory skills.

Overall satisfaction with the computer-based therapy program was somewhat less than expected. The authors obtained useful information from two of the participants who indicated a preference for face-to-face therapy or an avoidance of computer-based training. Both veterans found it more difficult to concentrate and find quiet time away from distractions to complete the intervention. While both reported that their rationale for participation in the study was to remain home with their family, each participant cited family distraction as reason for preferring to come to the hospital to continue cognitive therapy. While this intervention proved to be beneficial and was preferred by 50% of the sample, the current findings suggest that this mode of therapy may be unacceptable to some. Particularly, individuals with chaotic home or work environments may find receiving treatment online to be challenging, given the high probability of distraction. Alternative solutions include face-to-face treatment or establishment of a home or work routine that allows for minimal distraction, such as receiving treatment during a lunch break.

TBI knowledge and working memory increased significantly from baseline to follow-up. Effects were greatest on verbal memory, with only scattered improvement on nonverbal memory. Improvements in verbal memory were greatest among those with high levels of state anxiety at baseline, suggesting that the intervention may have been particularly beneficial for those with greater anxiety. Taken together, the results provide tentative evidence regarding the utility and efficacy of web-based skill building treatment for veterans of OEF/OIF.

Results of attention testing were not interpretable. Further research including pre-post attention testing would be beneficial. Cicerone et al. (2000) revealed that cognitive therapies directed at multiple domains of cognitive impairment can significantly improve neuropsychological performance in particular skill areas (e.g., attention, memory, problem solving). The
current intervention targeted metacognitive strategies including attention, memory, and problem solving. Our research lends support to Cicerone et al. While the study did not evaluate changes in attention, memory did improve in the absence of traditional drill and practice methods. Cognitive Load Theory (CLT), as researched by Sweller (1994, 1998, 2005, 2009), is based on knowledge of human cognitive architecture. Sweller’s 2005 report emphasizes the need to reduce extraneous working memory load to help facilitate knowledge acquisition in long-term memory. The following similar procedures to reduce cognitive load were employed in the present intervention: worked example effect (information discussed relates to the individual), the modality effect (computer-based training), and the redundancy effect (repetition is key). CLT specifies that optimal learning takes place when either the instructor limits the extraneous information or the intervention has limited distracting or unnecessary information. Consistent with Sweller’s theory and research, participants who had distracting home or work environments reported a preference for face-to-face therapy, presumably because the hospital therapy environment would be less distracting.

Post-intervention anxiety data were not obtained for the current study, thus making it impossible to determine if the intervention resulted in significant reductions in anxiety and if those reductions could be associated with greater improvements in performance. Results indicated significant correlations between anxiety at baseline and improvement in memory between pre- and post-intervention. One possible explanation is that individuals predisposed to anxiety in unfamiliar settings performed poorly on initial testing. Increased comfort over time, coupled with the skills learned in the intervention, could have yielded higher post-intervention scores on certain subtests.

Although we found significant improvements on the outcomes that we examined, it remains unclear if the assessments we employed effectively captured the extent and nature of participant gain. At present, the physiologic mechanisms surrounding post-concussive syndrome are unclear. There are no tests that target mild traumatic brain injury as a result of blast trauma. Further studies of the blast trauma population may utilize instruments targeting patient report of executive and affective deficits, such as, respectively, the Brief Executive Function Assessment-Adult (BRIEF-A, Roth, Isquith, & Gioia, 2005) and the Center for Epidemiological Studies Depression Scale (CES-D, Radloff, 1977).

**Limitations**

These are preliminary findings and care must be taken in generalizing from these results. The study was conducted with a small sample that is not necessarily representative of the broader population of veterans with mild TBI. Because all participants had a diagnosis of a mild TBI, findings may not generalize to a more severely injured sample. The high ratio of outcome measures to participants increased the possibility that some findings may have been attributable to chance alone. Given the lack of a control or comparison group of non-impaired veterans, it is impossible to determine how much of the documented improvement was associated with factors other than the treatment (e.g., practice effects, the passage of time, family support). Lack of funding and available staffing made participant recruitment a challenge. Incorrect pre-post testing administration forced us to reduce the number of outcome measures for attention and anxiety.

An additional limitation was our use of a program designed for adolescents, not for the veteran population. Efforts to update the intervention to be age and content appropriate were limited due to lack of funds. Participants’ post-intervention suggestions included the addition of a veteran-specific didactic component and updating the graphics. Nonetheless, the results, taken together, suggest that the veterans liked the program sufficiently to warrant further consideration and exploration of this treatment method.
Future Directions

This study represents an important next step in developing effective online interventions for veterans with TBI. Further studies will benefit from assessing attention pre-post intervention. Thus, further testing with a larger group of individuals and a comparison group will be needed to demonstrate the effect of web-based treatment on verbal memory, nonverbal memory, and attention. Studies that compare online intervention to alternative treatments (e.g., attentional control) will be important in determining the unique effects of the intervention. Future studies should include longer term follow-up to establish maintenance of gains. Nonetheless, the results provide important preliminary evidence of the potential feasibility and efficacy of online cognitive rehabilitation for veterans with TBI.

Acknowledgments

The authors acknowledge the contributions of Dr. Peter Chiu, Kendra Williams, and members of the VA Speech-Language Pathology and Audiology department, especially Dr. Kathy Groves-Wright.

This article is based on work supported in part by the Department of Veterans Affairs (Cincinnati Veterans Affairs Medical Center) and a National Institute on Disability and Rehabilitation Research grant (H133G050239) to the second author. The contents do not represent the views of the Department of Veterans Affairs or the U. S. Government.
References


CEU Questions for Riegler, Wade, and Neils-Strunjas
A Web-Based Cognitive Therapy Intervention for Veterans with Mild Traumatic Brain Injury

1. Soldiers with mild TBI frequently experience:
   a. PTSD
   b. Obsessive-compulsive disorder
   c. Depression
   d. Euphoria
   e. A & C

2. Military personnel referred for mental health services after deployment actually get those services:
   a. Always
   b. Most of the time
   c. About half of the time
   d. Rarely
   e. Never

3. The Test of Memory and Learning 2nd Edition (TOMAL-2) assesses:
   a. Pragmatic functions
   b. Executive functions
   c. Self-awareness
   d. Orientation
   e. Memory and Learning

4. Subtests on the TOMAL-2 include all but one of the following:
   a. Memory for stories
   b. Abstract visual memory
   c. Object recall
   d. Auditory comprehension
   e. Facial memory

5. When surveyed about levels of satisfaction, this sample of veterans with mild TBI rated all but one of the following as a positive outcome.
   a. Comfort in working with a computer
   b. Program provided useful organizational strategies
   c. Expressed complete satisfaction with home based computer therapy over face to face intervention
   d. Generally satisfied with the computer based therapy program
   e. Majority express interest in continuing face to face cognitive therapy
Abstract

Studies have shown that productive involvement in communicative activities contributes to effective learning of language (Beebe, 1983; Bell & Margolis, 1985; Ely, 1986; Rubin, 1975). Moreover, risk-taking behavior (e.g., voluntarily verbalizing) is an important element in obtaining proficiency in a second language. However, these studies have not correlated specific items involved in the construct of risk-taking in second language learning with a standard measure of language proficiency to determine the statistical significance of this relationship. The present study examined the relationship between risk-taking and second language proficiency. The language proficiency of 30 bilingual (Spanish-English) children was assessed and correlated with their risk-taking scores. In addition, the participants’ demographic characteristics were correlated with both their risk-taking and second language proficiency. A significant relationship was found between risk-taking and second language proficiency. The number of years the participants spent in the United States was also found to be correlated with both risk-taking and proficiency in the second language. While it cannot be concluded that risk-taking causes second language proficiency, the reciprocal relationships cited above have important implications for both clinical intervention and future research.

Keywords: risk-taking, bilingual, second language, Spanish-English, language proficiency

Learning Objectives

1. Name three language-related risk-taking behaviors.
2. Indicate the benefits of risk-taking in language learning environments.
3. State the statistical relationship between risk-taking and second language proficiency, based on the findings of the current study.

Personality Variables of Risk-taking

The construct of risk-taking has received intensive investigation in psychology, where it is often associated with destructive behaviors and regarded as a negative phenomenon (Christopherson & Jordan-Marsh, 2004; Lavery, Siegel, Cousins, & Rubovits, 1993; Miller-Johnson et al., 2003). This is the case because the risk behaviors studied, such as excessive drinking, careless driving, and gang membership, usually have negative consequences. Such studies generally aim to investigate the variables responsible for those behaviors in an effort to suggest ways for decreasing such behaviors.

One area of risk-taking involves personality. Studies of personality characteristics and risk-taking indicate that persons of high achievement motivation tended to be moderate risk-takers.
Conversely, low achievement motivation individuals were found to be either low or high risk-takers (Atkinson, 1958; Atkinson & Feather, 1966; Hamilton, 1974). Hamilton (1974) validated findings by Atkinson (1958) based on probabilities of success on a ring toss task. Other investigations of personality characteristics and risk-taking have included the locus of control and the extent of introversion or extroversion of individuals. Additionally, age and gender factors as related to risk-taking have been studied (Bayar & Sayil, 2005; Bridge, Judd, & Moock, 1979; Coet & McDermott, 1979; Ely, 1986; Karabenick & Addy, 1979; Kogan & Wallach, 1964). Few studies in the psychological literature explore the benefits of risk-taking (e.g., Dworkin, 2005).

Situational Variables Affecting Risk-taking

The relationship between risk-taking and achievement motivation is also influenced by other variables. A second area of risk-taking research has been concerned with the skill levels, rewards, and prior experience of individuals, as situational variables that affect risk-taking. In situations requiring skills, participants demonstrated moderate risk-taking, while in chance situations they tended to be either extremely risky or conservative (Kogan & Wallach, 1967). Risk-taking has also been shown to increase with high intrinsic or extrinsic rewards (Gorn & Goldberg, 1977). However, research on prior experience of individuals is contradictory (Edwards, 1962; Kogan & Wallach, 1967).

In one of their three studies of risk-taking in games of chance and skill, Sorrentino, Hewitt, and Raso-Knott (1992) found that “achievement-related motives and uncertainty orientation predicted risk-taking” in skilled situations (p. 532). “Uncertainty-oriented” individuals prefer moderate risk to other risk levels, while “certainty-oriented” individuals preferred high or low risk. Additionally, “success-oriented” individuals demonstrated a preference for moderate risk as compared to “failure-threatened” individuals. Sorrentino et al. further the understanding of risk-taking in that they demonstrate that individuals who typically are inclined towards moderate risk-taking might deviate from this preference due to the combined factors of “uncertainty orientation” and “achievement motivation.”

Social Setting and Risk-Taking

A third area of risk-taking research in the psychological literature has focused on the social setting in which individuals interact. Risk-taking has been shown to be higher in a group setting, as opposed to when an individual is expected to act alone (Clark, 1971; Kogan & Wallach, 1967). This finding has been referred to as the “risky shift phenomenon.” Group risk-taking has been investigated as a function of different leadership styles (Miller-Johnson et al., 2003; Wehman, Goldstein, & Williams, 1977), competitive versus cooperative group environments (Lupfer, Jones, Spaulding, & Archer, 1971), and friendship versus family groups (Noe, McDonald, & Hammitt, 1983). A highly consistent finding to emerge from the research is that greater risk-taking occurs in social settings, which are cooperative and friendly, rather than those that are restricted and competitive.

Risk-taking and Second Language Learning

While there is abundant research on risk-taking in the psychological literature, mainly focusing on negative ramifications (Christopherson & Jordan-Marsh, 2004; Lavery et al., 1993; Miller-Johnson et al., 2003), there is relatively little research investigating the effects of risk-taking on second language learning. Learning a second language is a complicated and challenging process involving a variety of factors, some of which are intrinsic to the learner and others which are extrinsic. Some intrinsic factors include personality characteristics such as extroversion (Busch,
anxiety (MacIntyre & Gardner, 1989) and risk-taking (Beebe, 1983; Ely, 1986; Oxford 1990, 1992; Skehan, 1989), which can either positively or negatively affect second language learning. Information about these factors can improve understanding of students’ language learning profiles and help determine how we should provide language services to them. With regard to risk-taking, there is sufficient evidence to suggest that this factor is important for second language learning (Beebe, 1983; Oxford 1990; Oxford, 1992; Zafar & Meenakshi, 2012).

Research indicates that second language learners engage in “moderate but intelligent” (Oxford, 1992, p. 38) risk-taking rather than avoiding risk or taking excessive risks without utilizing some background knowledge (Oxford, 1990). Risk-taking is necessary for effective second language learning. Conversely, lack of risk seriously interferes with the language development process. “Students who avoid risks are stalled by actual or anticipated criticism from others or by self-criticism that they themselves supply. When they do not have enough practice, their language development becomes seriously stunted” (Oxford, 1992, p. 38).

Beebe (1983) studied the risk-taking of bilingual (Spanish-English) children in a classroom situation as a function of the language characteristics of the interviewer who participated in the study. The number of Wh-questions, accuracy of “Do” insertion in Wh-questions, amount of talk, and volunteering were the risk-taking behaviors measured. Higher risk-taking levels were demonstrated with a monolingual English-speaking interviewer than with bilingual Spanish or English-dominant Hispanic interviewers. Beebe suggested that it is more natural for the bilingual Spanish-English child to speak in English to a monolingual English speaker. Speaking in English to a Hispanic interviewer may seem unnatural. A second finding of this study indicated that high risk-taking children were less likely to produce syntactically correct utterances.

Ely (1986) found risk-taking to be a positive predictor of class participation for first year students of Spanish. Class participation, which was defined as the number of times a child volunteered information, was also found to be a positive predictor of the child’s “oral correctness.” This finding contradicts the Beebe (1983) study, which found that high risk-takers were likely to demonstrate reduced oral correctness. Another study of risk-taking and second language learning was conducted in a French class using students classified as “good” and “poor” language learners (Naiman et al., 1978). Four risk-taking behaviors were found to be highly correlated with measures of language proficiency: student hand-raising, student call-outs, complete responses, and correct responses.

**Increasing Risk-taking Behaviors**

Researchers in the area of second language learning have offered suggestions for teachers to improve the risk-taking behaviors of their students (Oxford, 1990, 1992; Zhang & Head, 2009). For example, teachers can assuage students’ fears by informing them that they should not be concerned about understanding everything about the communicative situation initially, by providing classroom discussions of fears, and by providing individual counseling for students who are reluctant to participate. They should also guide students as to appropriate strategies for risk-taking (e.g., guessing) and determining the optimal situations where they should take risks (Oxford, 1992). Involving students in course planning and in the selection of classroom activities has also been shown to increase classroom risk-taking behaviors (Zhang & Head, 2009).

Zhang and Head (2009) studied the group participation behaviors of non-English majors at a university in the People’s Republic of China. During their first year, students demonstrated little willingness to participate verbally in group activities. In the second year, the teacher decided to involve students in course planning. The
hypothesis was that this type of participation in activities of their choice would improve their motivation for speaking English. Assessments of the success of the approach included student self-evaluation, classroom observations, and tests. Results indicated that students who actively participated in course planning and verbal group participation activities received higher scores (particularly on “interaction communication”) than students in another class taught using a traditional method of course design.

Summary
A major trend in research on risk-taking indicates that cooperative and friendly group settings are more conducive to greater risk-taking as compared to those that are competitive and restrictive. In the area of second language learning, one important finding was that risk-taking is related to skill or proficiency in a second language (Beebe, 1983; Ely, 1986). However, there is conflicting evidence in this respect. Specifically, higher risk-takers in a linguistic situation tend to produce less syntactically correct utterances according to Beebe (1983), while Ely (1986) and Naiman et al. (1978) found that risk-taking positively predicted correctness of oral productions.

The present study extends previous research on risk-taking and second language proficiency, since previous findings in this area have been contradictory. The primary purpose of this investigation was to determine the relationship between a specific set of risk-taking behaviors and the second language proficiency of Spanish-English bilingual children. A secondary purpose was to investigate whether participants’ demographic characteristics are related to risk-taking behavior or to second language proficiency. If risk-taking behavior is found to be characteristic of proficient second language learners, perhaps methods for enhancing risk-taking could be investigated and developed. The first hypothesis is that risk-taking and second language proficiency will be positively correlated. The second hypothesis is that number of years of United States residency, the percentage of English spoken in the home, the number of older siblings, and the number of years of education for each parent will be positively correlated with both risk-taking and second language proficiency.

Methods
Participants
The participants were 30 typically developing bilingual Spanish-English second grade children from two public schools in an urban school district in Northern New Jersey. Fifteen of the participants were males and fifteen were females. Thirteen of the children were seven years of age, fourteen were eight years old, and three were nine years old. The mean age for the 30 participants was eight years. The primary language spoken in the home of all the participants was Spanish. Nineteen of the participants were native Spanish-Americans (born in the United States), while the remaining eleven were born in one of several Spanish-speaking countries. All participants were enrolled in Bilingual classes for one year, having been identified by the school district as requiring bilingual instruction based on their performance on the Language Assessment Battery (Abbott, 1982), which was administered by the school district.

Participants were required to have a high level of proficiency and strong dominance in Spanish (their native language), as indicated by a score of Level E or above on the IDEA Oral Language Proficiency Test (IPT) (Ballard & Tighe, 1985). This measure is purported to have a high degree of reliability as well as high internal and external validity (Ballard & Tighe, 1985). Both English and Spanish versions of the IPT were administered to all participants one week prior to their participation in a classroom language activity, from which the data for the study were generated. All 30 participants demonstrated “Fluent Spanish Speaking”
ability on the IPT (Level F), with a group mean of 72. Their English proficiency in English was defined as “Limited English Speaking” (Level C), with a group mean of 28.

Background information on the participants was obtained via a questionnaires sent to their parents. This background information included number of years the participant was in the United States (U.S.), the percentage of English spoken in the home, the number of older siblings in the family, and the number of years of education for each parent.

**Stimulus Preparation**

The stimuli used to elicit the risk-taking behaviors were two science experiments labeled “Fun Gas” and “Crazy Colors.” Science experiments were selected because they tend to stimulate the interest and cooperation of students and thereby encourage questioning and other verbal interaction (McGrath, 1986; Zachman, Barrett, Huisingh, & Blagden, 1983). Science activities encourage children to cooperate, explore cause-effect relationships, and ask questions (McGrath, 1986).

The following delineates the development of the stimuli. The author was videotaped as she conducted the two science experiments. Using videos standardized the stimuli. The videos were presented to groups of children. Both during and following each presentation, questions about the experiments were asked of the children.

**Stimulus Presentation**

The videotaped science experiments were presented to the children in their classrooms as part of their daily class activities. The four groups were comprised of fourteen children from two classes in one school and sixteen children from two other classes in a second school within the same school district. The two videotaped science experiments were counterbalanced in their presentation to each group of children. The children were seated in rows of three or four to optimize visibility and audibility of the presentations.

Students were instructed to observe each science experiment and question or contribute information either during or after the presentation. Throughout each video presentation, the videotape was stopped at previously designated points to give the children opportunities to respond to the stimuli as well as to answer questions asked on the videotape. Additionally, each child was randomly called upon twenty times to provide answers to questions. These elicitation procedures and the questions utilized in the videotaped presentations follow the suggestions of previous researchers (Bloom, Engelhart, First, Hill, & Krathwohl, 1984; Zachman et al., 1988) for ensuring opportunities for a maximum amount of verbalization.

**Data Analysis**

Three speech-language pathologists served as judges in rating the responses of each of the children. The judges were not informed of the language proficiency scores of the students and two of the judges were unaware of the nature of the investigation. A risk-taking score was calculated for each child by totaling the frequency of “call-outs,” “hand-raising,” and “elaborations” they produced in response to the questions. Inter- and intra-judge reliability was calculated at 92% and 89% respectively.

The risk-taking scores were correlated with the IPT (English version) scores of the students using a Pearson product-moment correlation. A series of product-moment correlations followed, to determine the relationship between the students’ demographic characteristics and language proficiency and risk-taking scores. An alpha level of .05 was set for rejecting the null hypothesis for each of the analyses.

**Results**

Table 1 presents the results of the correlations between risk-taking and second language proficiency scores, and between the students’ demographic characteristics and their risk-taking and language proficiency scores. The mean scores presented in Table 1 indicate that the students’ families spent an
average of five years in the United States, and that English was spoken at home about one-third of the time. Most students had one or two older siblings. The average amount of parental education was quite low. While mothers obtained approximately 10 years of formal education, fathers received on average an 8th grade level of education. The mean risk-taking score of 98 represents the frequency of the combined risk-taking behaviors. The mean language proficiency score of 27.97 indicates “Level C” on the IPT, defined as “Limited English Speaking” (LES).

Results of the correlational analyses indicate that a significant relationship was obtained between risk-taking and second language proficiency scores ($r = .40$, $t = 2.31$, $p = .027$). The remaining correlations resulted in two additional significant relationships. The number of years spent in the U.S. was found to be significantly correlated with second language proficiency ($r = .40$, $t = 2.31$, $p = .027$), and the risk-taking scores ($r = .53$, $t = 3.35$, $p = .002$). No significant relationships were found between the remaining demographic characteristics and either risk-taking or second language proficiency scores. The first hypothesis was supported by the results in that risk-taking and second language proficiency were significantly correlated. There was partial support for the second hypothesis concerning the relationship between demographic variables and risk-taking and language proficiency. Specifically, the longer children resided in the U.S., the higher their level of proficiency in the language and the higher their level of risk-taking. The remaining aspects of the second hypothesis were not supported by the findings.

### Discussion

Results of the present study demonstrated that children who displayed a higher degree of risk-taking behavior during classroom activity were more proficient in their second language (English). Conversely, low risk-taking children were found to be less proficient in English. This finding corroborates the research results of both Ely (1986) and Naiman et al. (1978), who discovered a positive relationship between risk-taking and “oral correctness,” one aspect of language proficiency. The measure of language

<table>
<thead>
<tr>
<th>Variable</th>
<th>M</th>
<th>SD</th>
<th>r</th>
<th>t</th>
<th>p</th>
<th>R</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Years in U. S.</td>
<td>5.24</td>
<td>2.84</td>
<td>.53</td>
<td>3.35</td>
<td>.002</td>
<td>.40</td>
<td>2.31</td>
<td>.027</td>
</tr>
<tr>
<td>% of English in home</td>
<td>31.33</td>
<td>27.63</td>
<td>.02</td>
<td>0.10</td>
<td>.879</td>
<td>.22</td>
<td>1.20</td>
<td>.239</td>
</tr>
<tr>
<td># of Older Siblings</td>
<td>1.51</td>
<td>1.31</td>
<td>.13</td>
<td>0.70</td>
<td>.494</td>
<td>.14</td>
<td>0.73</td>
<td>.477</td>
</tr>
<tr>
<td>Mother’s Education</td>
<td>10.37</td>
<td>2.98</td>
<td>.14</td>
<td>0.72</td>
<td>.480</td>
<td>.04</td>
<td>0.19</td>
<td>.828</td>
</tr>
<tr>
<td>Father’s Education</td>
<td>8.47</td>
<td>4.98</td>
<td>.13</td>
<td>0.70</td>
<td>.497</td>
<td>.30</td>
<td>1.71</td>
<td>.093</td>
</tr>
<tr>
<td>Risk-taking Scores</td>
<td>98.03</td>
<td>40.05</td>
<td></td>
<td></td>
<td></td>
<td>.40</td>
<td>2.31</td>
<td>.027</td>
</tr>
<tr>
<td>Language Proficiency Scores (English)</td>
<td>27.97</td>
<td>16.67</td>
<td>.40</td>
<td>2.31</td>
<td>.027</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Means, Standard Deviations, and Product-Moment Correlations for Children’s Demography, Risk-Taking, and Second Language Proficiency, $p = .05,$
proficiency (the IPT) used in the present study assesses syntactic, morphological, lexical, and phonological components of language for their correctness, appropriateness, and completeness. Results of this study contradict findings of Beebe’s (1983) study, which reported that risk-taking behavior and syntactic correctness shared a negative relationship. It is possible that Beebe’s (1983) findings may have been due to the limited structures studied, specifically “Do” insertion in “Wh-questions,” or to the small participant sample used for the study (N = 9).

The number of years that the students’ families lived in the U.S. was also found to be positively related to both their risk-taking and language proficiency. This particular finding suggests that as children become integrated and familiar with a new culture and language, they increase their risk-taking behaviors associated with language. Surprisingly, other demographic factors including parental education, number of older siblings, and amount of English spoken in the home were not related to either risk-taking or second language proficiency.

This study was able to uncover only two variables that influence proficiency in a second language: risk-taking behavior and the amount of time spent in the U.S. However, these are two of many possible variables. Additional research is necessary to uncover others. The findings from this study must be treated with caution in that correlation does not suggest causation. The results are useful in that they provide a preliminary step into the investigation of factors influencing second language proficiency.

These results suggest that children learning a second language may enhance their proficiency by increasing their risk-taking behaviors. It is likely that behaviors such as questioning, calling out, and elaborating on an idea or concept provide increased opportunities to practice the second language. In this regard, Rubin (1975) states that “the good language learner takes and creates opportunities to practice what he has learned” (p. 44). Beebe (1983) asserts that a certain level of risk-taking is necessary for learning a second language. If risk-taking facilitates second language proficiency, speech-language pathologists charged with enhancing and remediating the language of bilingual children should consider structuring risk-taking conditions to facilitate the achievement of language goals. Facilitative conditions for risk-taking involve rewards (Gorn & Goldberg, 1977), group settings that are cooperative and friendly (Clark, 1987; Kogan & Wallach, 1967; Lupfer et al., 1971; Noe et al., 1983), and perhaps ethnicity requirements for group leaders (Beebe, 1983). Speech-language pathologists, in conjunction with ESL teachers, might best facilitate risk-taking, language acquisition, and remediation in the natural environment of the classroom. Activities similar to those used in the present study, along with rewards for participating, may prove effective.

Additionally, the types of classroom activities can influence the amount of interaction demonstrated by students. For example, collaborative, interactive, and interesting activities will stimulate more responses from students than “traditional” activities such as rote learning (e.g. practicing target forms without a pragmatically applicable context) (e.g., Zhang & Head, 2009).

Future research could investigate the effect of specific risk-taking behaviors and environments on second language proficiency. Investigations should also be undertaken to determine additional correlates of risk-taking and second language proficiency involving typically developing children and those with language disorders. The propensity for risk-taking and the acquisition of a second language may be influenced by parental communicative style (Iglesias, 1985; Lerman, 1984), cultural and socioeconomic factors in the family (Laosa, 1975; Mattes & Omark, 1984), or parental attitudes toward education (Lerman, 1984). It is likely that the process of acquiring a second language is highly complex. The present study has contributed to a small extent to the understanding of this process.

**Acknowledgements**

Grateful appreciation is extended to Albert R. Oratio, Kathy Hall-Olsen, Jennifer Ryan Hsu, and Cheryl Gunter for their careful critique of this research.
References


CEU Questions for Washington
Risk-Taking and Second Language Proficiency in Bilingual Spanish-English Children

1. In studies of personality characteristics and risk-taking, persons of high achievement motivation are __________.
   a. Moderate risk-takers
   b. High risk-takers
   c. Low risk-takers
   d. Highly concerned individuals
   e. Averse to risk

2. Social settings that encourage risk-taking are those that are__________.
   a. Restricted and competitive
   b. Cooperative and friendly
   c. Isolating and demanding
   d. High-achieving
   e. Undemanding

3. Results of the current study indicated that __________.
   a. Risk-taking is marginally correlated with second language proficiency
   b. Risk-taking is not significantly correlated with second language proficiency
   c. Risk-taking is significantly correlated with second language proficiency
   d. Risk-taking is significantly correlated with first language development
   e. Risk-taking is highly correlated with phonological skills

4. In the current study, another significant relationship with risk-taking was found with __________.
   a. Number of years in the U. S
   b. Maternal education
   c. Paternal education
   d. Number of siblings
   e. Country of origin
Abstract

This article examines nine of the 11 key domains that are essential for high quality services via telepractice (American Speech-Language-Hearing Association, 2005a) with an application to Australia’s Royal Institute for Deaf and Blind Children (RIDBC) Teleschool model of service delivery. Two of these domains: 1) Licensure, Liability, and Malpractice and 2) Reimbursement will not be addressed in this paper, as there is no equivalent Australian application. The other nine areas focus on specific knowledge and skills related to telepractice and are relevant regardless of location. RIDBC Teleschool carefully considered each of these areas in establishing a high quality telepractice program. Additional insights related to staff selection, ongoing training, in person contact, preparation, and pedagogy are discussed.

Keywords: telepractice, deaf, speech-language pathology, audiology, RIDBC Teleschool

Learning Objectives

1. Discuss the benefits of telepractice for young children who are deaf/hard-of-hearing.
2. Describe the key components of a successful telepractice pedagogy.
3. List the three distinct types of interaction typically seen in a telepractice session.

Telepractice is defined by the American Speech Language and Hearing Association (ASHA, 2005a) as “the application of telecommunications technology to delivery of professional services at a distance by linking clinician to client, or clinician to clinician, for assessment, intervention, and/or consultation” (p. 1). Telepractice is not a new concept and various forms of telepractice have been used in telehealth and telemedicine for a number of years. Implementation of telehealth grew from the early use of basic telecommunications, such as using a telephone to diagnose a patient remotely (Wallace, Wyatt, & Taylor, 1998), to store-and-forward applications (Kokesh, Ferguson, Patricoski, & LeMaster, 2009), through to more advanced applications, such as remote tele-robotic surgery (Anvari, 2007).

Recent advances in technology have enabled a wider range of applications in other fields, such as direct provision of audiology and speech-language pathology services. ASHA’s (2002) survey report on telepractice use among ASHA members indicated that 11% of respondents were currently using telepractice and a further 43% were interested in using telepractice in the future. Respondents cited particular barriers to implementation including:

- cost,
- concerns about malpractice, reimbursement, and licensure,
- lack of professional standards,
- insufficient knowledge about telepractice, and
- limited understanding of technology.

The survey recommended that ASHA provide more detailed information about the use of telepractice in audiology and speech-language pathology. Subsequent to this survey, ASHA (2005b) issued a position statement supporting the use of telepractice as an acceptable model of service delivery, provided that services delivered by telepractice were of comparable quality to services delivered in person. To assist practitioners in adopting the use of telepractice, ASHA (2005a) outlined 11 key domains that are essential for high quality services via telepractice, including:

- uses of technology,
- types of technology,
- client selection for telepractice,
- selection of assessments and interventions,
• cultural and linguistic variables,
• use of support personnel,
• evaluation of effectiveness and outcomes,
• documentation,
• licensure, liability, and malpractice,
• reimbursement, and
• privacy/security.

In Australia, the Royal Institute for Deaf and Blind Children (RIDBC) has implemented a national telepractice program, known as RIDBC Teleschool, which has delivered therapy and educational services to more than 400 children with hearing or vision impairment since its inception. The program supports children from birth to 18 years of age and provides regular, ongoing sessions to address the child’s hearing or vision needs. This paper will focus on the early intervention component of the service for hearing impaired children, which uses a family-centered approach to support families in developing the child’s listening, speech, and language skills.

RIDBC Teleschool purposefully incorporated the 11 key areas that are essential for high quality services via telepractice (ASHA, 2005a). Two areas: 1) Licensure, Liability, and Malpractice and 2) Reimbursement are not directly comparable between Australia and the United States and will not be addressed in this article. RIDBC Teleschool has discovered additional areas that should be considered in establishing an effective telepractice program, such as staff selection, ongoing training, pedagogy, in person contact, and preparation.

Domain 1: Uses of Technology

The first domain specified by ASHA (2005a) is “uses of technology” and includes synchronous and asynchronous applications as well as self-monitoring by clients. Synchronous applications are defined by the real-time exchange of information, such as videoconferencing or instant messaging. Conversely, asynchronous applications are available on-demand to suit the client’s schedule, such as e-mail, blogs, and store-and-forward. Self-monitoring requires the client to supply information or data to the practitioner, such as independently completing a questionnaire. Each use of technology is better suited to particular purposes and a combination of synchronous, asynchronous, and self-monitoring may be necessary to provide services via telepractice that are comparable to in person services (Hrastinski, 2008).

RIDBC Teleschool primarily relies on synchronous applications using dedicated videoconferencing equipment to provide real-time two-way audio and video transmission between practitioner and client. Sessions occur weekly, generally for one hour. Sessions can be easily recorded and shared with family members who are unable to attend. This allows individuals to see the activities and strategies first-hand, rather than relying on a reported explanation from the parent who attended the session. Wider family participation in sessions results in greater support for the child’s development.

Asynchronous applications are also used to support the weekly sessions. RIDBC Teleschool employs a multimedia team consisting of a multimedia instructional designer, a website developer, a graphic designer, and a software engineer. This team develops a range of multimedia resources including print, mobile applications (apps), and web-based resources. Recent apps for iPad™ and iPhone™ devices, such as the RIDBC Auslan Tutor and Songs for Listening and Language, provide families with on-demand asynchronous learning opportunities. RIDBC Teleschool has developed a secure website for families enrolled in the program. The website includes public sections where families can connect with one another, ask questions, and access general information about relevant topics such as hearing impairment, hearing technology, and child development. The website contains private areas where families can interact directly with their practitioner asynchronously and access specific information related to their child. Each week, the practitioner reviews the video recording of the session and edits salient clips related to specific goals or strategies. These clips are
posted to each family’s private blog with written commentary that forms the basis for further discussion. Practitioners can initiate a discussion about specific strategies or techniques and provide families with prompts to further develop their skills. Asynchronous interaction of this type allows the family to self-monitor and provide feedback to the practitioner.

**Domain 2: Types of Technology**

ASHA’s second domain, “types of technology,” addresses the issues of equipment, bandwidth, transmission methods, and networks (ASHA, 2005a). Various types of technology are available and the choice of technology will be influenced by the practitioner’s purpose, needs, and budget. As a starting point, the practitioner should consider the goals to be achieved by telepractice and the type of technology that will best support that goal. Videoconferencing is enabled through the digital compression of the audio and video signals by a codec. This can be achieved through dedicated videoconferencing equipment or web-based software on a computer. RIDBC Teleschool primarily uses dedicated videoconferencing equipment with an internal codec, manufactured by companies such as Polycom or Cisco. Each set of equipment includes a large television monitor, camera, and microphone. Cameras have a high quality lens and a variety of remotely controlled features such as pan, tilt, and zoom. Practitioners use a remote control to access these features on their own camera, as well as remotely on the participant’s camera. Additional features of dedicated equipment include the ability to record sessions, share content, such as a presentation or a website, and include multiple participants in a session. Dedicated equipment can be monitored remotely from a central site, regardless of the location of individual units. Monitoring includes technical management of software and hardware as well as troubleshooting equipment and connections. This level of maintenance is difficult to achieve when families use their home computer rather than dedicated equipment. All of these factors influenced RIDBC’s decision to use dedicated videoconferencing equipment rather than web-based applications such as Skype. Despite the increasing availability of high-speed broadband connections, current web-based applications do not provide the same audio/visual quality, reliability, or flexibility that dedicated equipment can offer.

Videoconferencing places high demands on the transmission methods, requiring equally fast upload and download rates at both the sending and receiving ends of the connection. RIDBC Teleschool has found that a rate of 384 kilobits per second (Kbps) in both directions is sufficient for standard definition telepractice applications. Although faster rates may provide better video quality, in some cases, faster rates provide a less stable connection, resulting in freezing of the video signal or dropping of the signal altogether. With the increasing availability of high definition equipment, faster transmission speeds may become necessary.

High-speed transmission is generally achieved in one of two ways: Integrated Service Digital Network (ISDN) or Broadband, sometimes referred to as Internet Protocol (IP). Different types of broadband transmission may be available depending on location, including Satellite, Asymmetric Digital Subscriber Line (ADSL), or cellular. RIDBC Teleschool uses each of these transmission methods in various locations depending on the availability, reliability, and cost for each client.

In addition to bandwidth rate, reliability of the connection is affected by contention and network capacity. Contention refers to competition between users trying to use the same resources at the same time. This is most obvious at peak times of day when Internet connections slow due to increased demand. It is difficult to limit contention on a public Internet network, such as a home Internet plan. To overcome this challenge, RIDBC has created a private, dedicated network between clients and practitioners where technical parameters can be set to prioritize data flow and
limit contention. Another common challenge is network capacity, which refers to the total amount of bandwidth available in a particular location. Advertised bandwidth rates often represent available or optimal rates rather than actual rates. The number of users allocated to a particular network influences actual rates. For example, if the total network capacity is 50Mbps and there are two households connected to the network, the available bandwidth per household might drop to 25Mbps if both households are using the network at the same time. However, if fifty households are connected to the same network and use it simultaneously, the average available bandwidth could be as low as 1Mbps per household.

The practitioner should consider the availability of on-demand, and preferably, on-site, technical support. RIDBC Teleschool has established a four-tier system of support with varied responsibilities at each level. Practitioners are trained in basic troubleshooting and when problems arise, practitioners complete a troubleshooting checklist before proceeding to the next level of support. Second level support personnel have additional training and knowledge of different types of equipment, transmission methods, and networks but are not ICT professionals. Third level support consists of ICT professionals who have received additional training in the specific equipment and technology infrastructure at RIDBC Teleschool. Fourth level support is provided by an external agency contracted by RIDBC Teleschool to address any issues that cannot be resolved by the first three support levels.

Domain 3: Client Selection for Telepractice

ASHA (2005a) requires practitioners “to select clients who are appropriate for assessment/ intervention services via telepractice” (p. 3). Practitioners should select clients by considering a range of factors that could influence the effectiveness of a telepractice session such as physical, sensory, cognitive, behavioral, and communicative characteristics. Although these factors are taken into account at RIDBC Teleschool, their significance may appear contrary to ASHA’s guidelines. The presence of a sensory impairment (hearing or vision) is mandatory for enrollment in RIDBC Teleschool, rather than prohibitive. Eligibility is then contingent on the client’s access to local services. If both conditions are met, RIDBC Teleschool will provide a telepractice service. In most cases, the client is a young child who is supported by an adult caregiver. In this circumstance, the physical characteristics of both the client (child) and support person (adult) must be considered. In some instances, additional steps must be taken to ensure high quality telepractice, such as the provision of captions for a caregiver with a hearing impairment.

ASHA (2005a) emphasizes “the potential impact of the client’s support resources on his or her ability to benefit from telepractice” (p. 4). Support resources include availability of technology, access to resources, an adequate space for participating in telepractice, and access to technical support. RIDBC Teleschool views the consideration of support resources as paramount. When families enroll in RIDBC Teleschool, they are not immediately provided with in-home videoconferencing equipment. Instead, families begin sessions at a local studio for three important reasons. First, existing equipment at a local studio means RIDBC Teleschool can begin the intervention process immediately, without the delay of setting up telecommunications or installing equipment. Second, existing studios generally rely on a dedicated ISDN connection that has proven reliable and has sufficient bandwidth to support telepractice. Third, existing studios have technical support staff available to liaise with RIDBC Teleschool, which relieves the family of the initial burden of managing technology. After two to three months, the manager of RIDBC Teleschool reviews each family’s participation in the program and, in collaboration with the family, determines the appropriateness of installing dedicated videoconferencing equipment in the family home.
For many families, the idea of working through telepractice is novel. Although programs such as Skype may be familiar, most families have difficulty envisioning a model of telepractice. One way to familiarize families with telepractice is to engage them in a demonstration session. A local professional such as an audiologist, social worker, speech-language pathologist, or early intervention worker could organize a telepractice session between the family and RIDBC. The local professional and the family attend a session at a videoconference location, connecting to RIDBC for a brief demonstration session. The RIDBC Teleschool manager explains the program, demonstrates equipment use, displays resources, shows session plans, and answers family questions. The demonstration session provides an opportunity to discuss the expected roles and responsibilities of each participant, should the family choose to enroll in RIDBC Teleschool.

Equipment at RIDBC is set up in dedicated studios designed to support the delivery of effective telepractice. The studios include an adequate workspace with an uncluttered background, high contrast wall color, and excellent room acoustic properties. All furniture can be moved easily to support a variety in presentation. For example, the practitioner could sit at the table to play a board game with an older child, or move the table out of the way to engage in a more physical activity with a young child. Dedicated studios contain standard resources commonly used in sessions, such as whiteboards, computers, and colored paper. A selection of frequently used toys including animals, vehicles, and action figures are also kept in each studio. Ready access to common resources allows the practitioner to quickly alter her activities in response to the child’s level of engagement or spontaneous suggestions made by the family. Families are provided with support to set up a similar workspace in the home or studio where they are participating in a telepractice session. Initially, RIDBC Teleschool provides all lesson resources, because if the practitioner and the family have identical or similar resources, it generally makes the session more engaging for the child and allows for greater interaction between the child and the practitioner. Identical items are less necessary as children become more familiar with the concept of telepractice and as their cognitive skills develop. With time, families begin to develop more confidence in selecting their own resources and are able to generalize the weekly goals and activities to the materials available in their homes. Resources must be organized and sent well in advance of the session. Resources also need to be highly visible and encourage interaction. The practitioner may be required to source identical resources or larger, more visible items for display. Often, staff split resources into sets, such as sending half a set of matched pairs to play a matching game via telepractice. Another way to increase interaction is to divide a resource into smaller segments, such as sending part of a Lego set rather than the whole set, to encourage parallel play. These decisions must be made well in advance of the session to ensure the family obtains all of the required resources.

Domain 4: Selection of Assessments and Interventions

According to ASHA (2005a), the delivery of assessments and interventions by telepractice requires the practitioner to select the most appropriate assessments and interventions; to consider how to best deliver those assessments and interventions by telepractice; and to evaluate the impact of the administration of assessments and interventions via telepractice. Recent studies support the validity and reliability of assessments administered via telepractice (Crowell, Givens, Jones, Brechtsbauer, & Yao, 2011; Smith, Dowthwaite, Agnew, & Wootton, 2008; Waite, Theodoros, Russell, & Cahill, 2010).
During the initial enrollment period, children are assessed by RIDBC Teleschool staff in the areas of listening, receptive language, expressive language, speech, social communication/pragmatics, and cognition. Initial service delivery focuses on developing rapport with the child and parent, in order to further understand the child’s current skills and areas of need and ascertain the parent’s learning style. A family centered approach, focusing on a typical developmental sequence, is used. RIDBC Teleschool uses a range of assessment tools depending on the age and abilities of the child, including the Rossetti Infant Toddler Development Scale (Rossetti, 1990), the MacArthur Communicative Development Inventory (Fenson et al., 2007), the Bracken Basic Concept Scale (Bracken, 2007) and the Comprehensive Assessment of Spoken Language (Carrow-Woolfolk, 1999).

Assessments are generally delivered via videoconference using a specific administration protocol developed by RIDBC Teleschool. This protocol was developed following extensive informal investigation by RIDBC to ensure that assessment results achieved through telepractice administration are comparable to results achieved in person by the same students. Technical considerations include clarity of the audio and video signals, ease of administration, and reliability of the connection. In addition, access to visual cues, such as lip reading, and the size, clarity, and contrast of picture-based assessments were evaluated. A variety of methods were trialed to determine the most effective way to transmit visual images of both the tester and the test materials, including 1) alternating camera angles between tester and materials, 2) viewing both tester and materials at the same time by projecting the test materials onto an electronic whiteboard, and 3) viewing both tester and materials at the same time using a secondary camera. Each method was attempted with staff and method 3 was established as the preferred method of delivery.

If families are planning to visit RIDBC, assessments may be carried out in person during that visit. In rare circumstances where assessment by videoconference or in person is not possible, RIDBC Teleschool may collaborate with a local professional to complete the assessments with the child and forward the results to RIDBC. Assessments are completed every six months, as appropriate. Standardized assessments, which are designed to be administered no more than once per year, are administered as designed and alternated with a language sample being transcribed and analyzed at the six month mark.

Likewise, RIDBC Teleschool considers the effectiveness of any specific interventions to be delivered and whether delivery via telepractice is comparable to in person services. In most instances, telepractice can deliver a comparable service. However, telepractice may not be the most appropriate mode of service delivery where physical contact is necessary, such as manipulation of oral-motor musculature.

**Domain 5: Cultural and Linguistic Variables**

The cultural and linguistic differences of individuals can have an impact on the selection and delivery of appropriate interventions via telepractice (ASHA, 2005a). However, these differences should not preclude the use of telepractice, as there are many benefits for clients. For example, interpreters do not need to be physically present in the same location as the client. Interpreters can participate in telepractice by attending sessions in the same room as the practitioner or at a third location, using multi-point videoconferencing. The flexibility of location provides telepractice clients with access to a greater number of interpreters by expanding the search beyond the client’s immediate vicinity. In addition to interpreters, RIDBC Teleschool employs teachers of the deaf who are proficient both in English and in the client’s home language,
such as Cantonese, Mandarin, or Arabic. This eliminates the need for an interpreter and provides the family with information, instruction, and support directly in their home language.

With or without interpreters, practitioners should aim to integrate traditions and customs of the client’s culture into telepractice sessions. Cultural information can be obtained in a variety of ways, including staff training, research, liaison with community members, or through direct discussion with the client. RIDBC Teleschool uses a combination of these methods to learn about the traditions and customs of clients. Each year, staff members participate in cultural awareness training focused on specific topics, such as working with indigenous clients. Training often includes a research aspect about specific communities or languages. Research can be informal, such as reading information on a website, or practical, such as attending a cultural celebration. Local knowledge is gathered through communication with key community members, such as health workers or community elders. RIDBC Teleschool participates in regular telephone or videoconference meetings with community members who provide valuable information about culturally appropriate practices. Direct discussion with clients can provide further insight about their personal preferences. RIDBC Teleschool regularly seeks input from clients to ensure that aspects of their culture and language are included in weekly sessions.

In many cultures, extended family support is a cultural norm. For indigenous Australians, cultural identity, including access to community, family, language, and land, is intricately linked to their health and well-being (King, Smith, & Gracey, 2009). Illness, disease, and disability often force indigenous clients to travel away from their rural communities to access medical facilities in major metropolitan areas, which can have negative effects on their health (King et al., 2009). Telepractice interventions allow clients to remain in their community, which can reduce isolation from their culture and lead to greater involvement by extended family members. The use of telepractice can also lead to increased awareness of disability by other community members, leading to wider support networks for the client. In some instances, community members can provide valuable local knowledge to the practitioner or offer support to a client who might be initially reluctant to attend a telepractice session.

**Domain 6: Use of Support Personnel**

ASHA (2005a) recognizes the need for the use of support personnel in telepractice by expecting practitioners to provide appropriate training and supervision to support personnel.

Use of support personnel is crucial, as telepractice does not allow the practitioner to interact physically with the client or to manipulate the client’s materials or environment. The responsibility for managing the client, the materials, and the environment is transferred from the practitioner to the support personnel. This transfer of responsibility is complex and requires the practitioner to train the support personnel by offering specific strategies and ideas for managing these new responsibilities.

The aim of many early intervention programs is to provide families with strategies and skills to support their child with hearing impairment. Telepractice places a stronger emphasis on this aim by requiring families to assume the role of support personnel. In this role, family members must become active participants in the session and be willing to assume the responsibility handed over by the practitioner. This shift in role highlights one aspect of family-centered practice: the use of participatory helpgiving practices (Dunst, Boyd, Trivette, & Hamby, 2002). Participatory helpgiving focuses upon building on family strengths and empowering families to be actively involved in planning and implementing the session (Dunst et al., 2002). A meta-analysis of the literature by Dunst, Trivette and Hamby (2007) found that “use of family-centered helpgiving is associated with more positive and less negative parent,
Telepractice has the potential to enhance the use of family-centered helpgiving by practitioners. In a telepractice model, teaching parents is an integral component of a successful program. There is a strong emphasis on transferring knowledge and skills to the parent, because the practitioner cannot physically interact with the child in a telepractice model. This requires practitioners to have a thorough understanding of adult learning styles and of how to best engage families in the early intervention process. Adult learning styles influence every aspect of telepractice, including introduction of new information, answering parent questions, and clearly communicating the instructions and rationale for each activity. Practitioners must incorporate their knowledge of adult learning styles into the planning process and use this knowledge to deliver appropriately designed instruction for each participant.

Presentation may vary to include printed material, demonstration, visual supports, or discussion. Adult learning styles also influence the way practitioners coach and guide parents. Different coaching strategies may be more effective for different adult learning styles. Some parents may prefer direct instruction, while others prefer a questioning approach. Successful telepractice requires the practitioner to assess the parent learning style and provide the most effective coaching strategies for each participant. Most early intervention practitioners require additional training in adult learning and coaching.

Domain 7: Evaluation of Effectiveness and Outcomes

According to ASHA (2005a), practitioners using telepractice are expected to incorporate a variety of methods to measure effectiveness, clinical outcomes, and client satisfaction. RIDBC Teleschool uses qualitative and quantitative methods for evaluation of individual clients as well as the program as a whole. Individual goals are set for each student in collaboration with the family every six months. Goals focus on the areas assessed, namely, listening skills, receptive and expressive language, pragmatics, speech, and cognition. Families are asked to identify long and short-term goals for their child, which are then combined with the assessment results (see Domain 4) to determine the expectations for the next six-month period. These goals form the basis for the weekly telepractice sessions. Each week, the family is provided with a session plan outlining the goals and activities to be completed during the session. Goals are reviewed during every session and observations by the family and RIDBC staff are used to determine the activities for subsequent sessions.

Families are informally surveyed about their satisfaction with the service on a regular basis. A formal survey is also conducted annually in order to provide families with an opportunity to make comments anonymously. For most families, RIDBC Teleschool collaborates closely with local service providers, such as a preschool teacher or early intervention worker. When local service providers are involved in service provision, informal and formal surveys are conducted to ascertain their satisfaction with the service delivery via telepractice. These results and other evaluative information are provided to government funding agencies every six months.

Typically, local service providers are able to provide valuable local information but may lack the necessary experience or expertise in hearing impairment to provide comprehensive support to the family (Ludlow, Conner, & Schechter, 2005). In other cases, local service providers may not provide frequent, regular support, which can be supplemented by telepractice. Families have also commented on the benefit of working with one organization over time, regardless of the family’s location. Continuity of service means that families are able to maintain forward momentum in their child’s progress, rather than having to start over with a new practitioner every time the
family circumstances change. The flexibility of connecting through technology is particularly appealing to military families who relocate frequently, or to families living overseas where specialist hearing services may not be available.

Anecdotal evidence suggests that working through telepractice reduces the number of cancellations due to illness. Young children are susceptible to infections and programs generally have strict rules regarding the attendance of sick children. Telepractice allows families to attend early intervention sessions without the associated risk of spreading infection to staff or other children. Often, children are well enough to participate in a telepractice session even though they might be experiencing some minor symptoms, such as a cough or a runny nose. Families are often willing to persist with a telepractice session under these conditions, as the session can easily be adapted to reflect the child’s wellbeing. This benefit of telepractice also extends to children with significant health conditions or additional disabilities.

**Domain 8: Documentation**

Documentation is essential in telepractice. ASHA (2005a) cites informed consent and documentation of each telepractice session as the primary topics in this knowledge area. Upon enrollment in RIDBC Teleschool, families participate in an intake interview with the program manager via telephone or videoconference. The family provides practical information about the child’s medical history, hearing loss, and current listening and language skills. They also discuss personal information such as the family's expectations of the service, specific areas of needed support for the parents, and family aspirations for the child. During the initial interview, the family discusses logistics, availability, and preferred location for telepractice sessions. This information assists the program manager in obtaining informed consent from the family and allocating an appropriate staff member for the family’s needs. For example, if the child is currently in the process of undergoing cochlear implant candidacy, the family might be assigned a Listening and Spoken Language Specialists (LSLS) certified by the AG Bell Academy for Listening and Spoken Language (specifically, a Certified Auditory Verbal Therapist [LSLS Cert AVT]). If the family is considering sign language or other alternative communication, they might be allocated to a speech-language pathologist who can assist in choosing the most appropriate communication mode for the child.

Each telepractice session is documented in a session plan. The session plan includes sections for contact details, content, questions, comments, and follow-up. The contacts section includes information about the technology being used, names and roles of all participants, contact details for client and practitioner, and date/time of the scheduled session. The content section outlines the goals for the session, the resources needed, and how to implement each activity. The client receives the plan before the session and reviews the information. During the session, the practitioner uses a duplicate copy of the plan and writes notes about the client’s performance and achievement towards the goals. After the session, clients practice the activities and provide written feedback on the session plan. The session plan also includes space for the practitioner to record questions raised by the client or agreed follow-up actions. Written and/or verbal feedback are provided to the clients after each session. Client progress is evaluated regularly (see Domain 7) and written reports and updated program goals are provided every six months.

**Domain 9: Privacy and Security**

Client confidentiality can be compromised if practitioners are not diligent in ensuring privacy and security in telepractice sessions. ASHA (2005a) recommends knowledge about regulations pertaining to confidentiality of client information as well as methods for establishing
privacy protections on various types of technology. The practitioner will be able to choose the most appropriate means of maintaining privacy and confidentiality by having a clear understanding of the types of technology available (see Domain 2) and their associated security features (Trueb, Lammers, & Calyam, 2007). RIDBC Teleschool uses a variety of measures to ensure privacy and security. Equipment is password protected to prevent unwanted external access to management settings. Cameras do not answer automatically, preventing outside access to the equipment. For families using dedicated videoconferencing equipment in their homes, the equipment connects to RIDBC’s private IPWAN (Internet Protocol Wide Area Network), which is isolated from the Internet. This network has restricted access and is only available to registered users who are authenticated by RIDBC. For families using a home Internet connection, such as ADSL, security is managed by setting up a firewall that allows access to the ports needed for videoconferencing without allowing general access to the families’ home networks. Supplementary privacy measures such as Network Address Translation (NAT) and data encryption can be applied as needed. In addition to technological privacy, basic principles of in person privacy should also be observed. Clients should be made aware of any observers or participants who may not be visible onscreen. Consent should be obtained for any recording of audio or video footage and the use of that material should be clearly stated.

**Additional Telepractice Considerations**

In addition to the areas of clinical knowledge outlined by ASHA (2005a), RIDBC Teleschool has found areas for consideration when establishing a high quality telepractice service. ASHA (2005a) highlights the need for careful client selection, but other human factors such as staff selection, ongoing staff training, and in person contact are equally important in establishing a successful telepractice program. RIDBC Teleschool has learned that implementation of telepractice requires additional preparation and differentiated pedagogical processes. Telepractice is not simply the application of in person techniques to a visual medium. The practitioner needs to adapt in person techniques to maximize the benefits offered by telepractice. Each of these factors will be discussed briefly below.

**Staff Selection**

A wide range of skills is considered when hiring practitioners for a telepractice role. Time management and organization skills are necessary for the successful planning and preparation required for telepractice. Knowledge of early intervention with deaf/hard of hearing children is essential to supporting families, but must be paired with a willingness to acquire high-level technology competency. Practitioners must be creative in order to develop lessons that can be delivered successfully via telepractice and be flexible to adapt their lesson when there is an unexpected challenge. Practitioners must be persistent; working in a telepractice model poses unique challenges, such as technical difficulties or being unable to directly manage a child’s behavior. These situations require the practitioner to have unwavering determination in order to achieve session goals. This combination of experience, knowledge, flexibility, organization skills, and persistence is essential for an effective practitioner of telepractice.

Practitioners in a telepractice model must demonstrate an aptitude for using technology. Most practitioners will have limited experience with telepractice, but a willingness to develop technical skills is essential. Initially, practitioners require time to learn the functionality of basic equipment and how to operate it. Over time, practitioners develop skills in using advanced features of equipment to enhance service delivery. Because technology is constantly evolving, practitioners must maintain current knowledge of technical developments and their application.
Successful practitioners must be competent in understanding how the technology works, troubleshooting basic technical difficulties, and supporting families with technical issues.

Today, the RIDBC Teleschool team consists of thirteen full-time equivalent staff members and includes a combination of teachers and speech-language pathologists. RIDBC Teleschool primarily uses a listening and spoken language approach in service delivery; however, some staff are qualified to meet the needs of students who use sign language or other communication modes. Teachers hold a variety of qualifications including teacher of the deaf/hard of hearing, early childhood educators, primary school teacher, and secondary school teacher. Some staff hold qualifications such as Listening and Spoken Language Specialists (LSLS Certified Auditory-Verbal Therapists), speech-language pathologists, and sign language interpreters. Most staff members hold dual qualifications, creating a range of specialties such as LSLS Cert AVT/early childhood educator, or primary school teacher/teacher of the deaf. This combination of qualifications allows families to access practitioners who can meet the specific needs of their child and family. In addition, highly qualified staff who are competent in providing early intervention to deaf/hard of hearing children can focus on honing their skills in technology and telepractice pedagogy. Practitioners who have less training or are new to early intervention may find it difficult to focus on the added complexity of telepractice.

The staff at RIDBC Teleschool also includes professionals who are responsible for other aspects of the service. The program manager oversees and coordinates the program. An administrative/technical assistant schedules appointments and assists with troubleshooting technical problems. A multimedia instructional designer develops resources such as print booklets, web-based materials, and mobile applications to complement and enhance the delivery of telepractice sessions. An IT specialist manages the system infrastructure, tests new equipment, and implements technical solutions. The inclusion of these unique roles on our team significantly enhances the quality of our telepractice model.

Professional Development and Training

Practitioners using telepractice require intensive and ongoing training in technology and pedagogy. ASHA (2005a) supports the idea that “…ongoing education and training will be required to maintain expertise and familiarity with changes in technology and potential clinical applications” (p. 2). This is true for novice practitioners as well as highly qualified, experienced practitioners. Technology can be challenging and delivering a service via telepractice requires distinct skills. RIDBC Teleschool initially allocated four hours per week of team training: two hours for technology training and two hours for pedagogy discussion and skill development. As RIDBC Teleschool refined its pedagogy and developed a shared knowledge base, the amount of weekly training was reduced. However, staff continue to participate in an extensive professional development program including a two-hour team meeting each week, five full-day program development days each year, at least two peer observations each term, and continuing professional education opportunities through the RIDBC Renwick Centre. New practitioners are provided with at least six weeks of observation and training before working with families directly. Each new practitioner is assigned a mentor who provides guidance, feedback, and support during the early stages of telepractice.

In Person Visits

Families are encouraged to visit RIDBC’s main campus in Sydney. On-site accommodation is available and travel assistance is provided where possible. During a visit, families have the opportunity to meet their practitioner for intensive in person sessions and participate in
group sessions with other families. They are able to access a wide variety of professionals, such as occupational therapists, psychologists, and audiologists, for additional assessments as needed. Rapport can be enhanced by meeting families in person during visits to RIDBC, but this is not a necessary step. Visits are not a requirement of enrollment, as many families are unable to travel to Sydney due to personal circumstances, work obligations, or home location. Occasionally, RIDBC staff undertake outreach visits to families, but family visits to campus are more comprehensive and, in general, the benefits far outweigh the benefits of an outreach visit.

**Preparation**

Telepractice requires substantial preparation with regard to scheduling, setting up the workspace, and planning the session. Appointments must be booked at a time when the family, the practitioner, and the studio are concurrently available. Scheduling of telepractice sessions can be more flexible, with sessions occurring in the evenings or on weekends, when both parents and/or extended family members are available to participate. RIDBC Teleschool employs a dedicated staff member to streamline the scheduling process. This person serves as the primary point of contact for all external sites and is instrumental in locating potential telepractice sites for new clients. This team member is responsible for testing connections and providing technical assistance to RIDBC Teleschool staff. The staff member in this role must understand the implications of time zones and the compatibility of different types of technology and be highly organized.

Additional time should be allocated before the session to test the equipment and ensure an adequate connection can be achieved. The practitioner may require time to activate features of the equipment, such as adjusting camera angles or initiating recording of the session. The workspace must be prepared ahead of time and should remain uncluttered, to limit visual fatigue for participants. In order to achieve an uncluttered workspace, the practitioner may require additional workspace off-camera to keep items for subsequent activities within easy reach.

In preparing each session, the practitioner must analyze each planned activity and develop a clear explanation for implementation that will allow the family to effectively participate in the session. Session plans should be developed collaboratively with the family and include information about how to implement each activity, as well as tell why the activity is relevant. This provides the family with a framework for the session and assists in shifting the session from a professional-centered intervention to a family-centered intervention (Dunst et al., 2002). Each session follows a similar routine, beginning with dedicated time for building rapport with the child and family. This is followed by a review of the previous week’s activities and parent report on the child’s progress towards current goals. The practitioner provides feedback and strategies based on this information. A check of the child’s hearing devices is completed before the practitioner introduces new activities. Finally, time is set aside at the end of the session to summarize activities, answer family questions, and review goals for the upcoming week.

**Pedagogical Processes**

RIDBC Teleschool practitioners have found significant differences in the skills required for an in person early intervention model compared to those needed in a telepractice model. As a result, RIDBC Teleschool has developed and refined a model of telepractice pedagogy. Telepractice places heavy demands on practitioners, requiring them to adapt their existing early intervention skills to a telepractice model, as well as developing new skills specific to telepractice. Areas that are critical for a successful telepractice session include rapport building, knowledge transfer, and parent education.
Establishing rapport with children, students, and families can be challenging via telepractice. RIDBC Teleschool staff have developed a specific, purposeful protocol to ensure rapport is established and maintained throughout all sessions. Initial sessions are dedicated to building rapport and gathering background information. Subsequent sessions include planned opportunities for rapport building, such as discussing recent family activities or commenting on everyday topics such as the weather or sports. Practitioners also allocate specific time to allow spontaneous opportunities to occur. For example, a neighbor might visit unexpectedly and be invited into the session to say hello.

In a similar way, the success of a telepractice session relies on the practitioner’s comprehensive transfer of knowledge to families. Practitioners possess a wealth of acquired knowledge and experience that they rely on to make therapeutic decisions in every session, regardless of the setting. These skills become embedded in the practitioner’s daily practice and are often applied instinctively. During in person sessions, the practitioner can physically intervene in an activity without necessarily providing an explanation or comment about the instinctive decision. This may leave the parent unaware of the reason behind the practitioner’s subtle actions. In a telepractice session, physical intervention by the practitioner is impossible. The parent becomes a conduit for the practitioner, which means that every decision the practitioner makes must be transparent. The practitioner must clearly explain each decision so the parent can implement the action as effectively as the practitioner would if the practitioner were in the room with the child.

In each session, three distinct types of interactions can occur: 1) the practitioner provides direct intervention to the child, 2) the practitioner observes and coaches the parent during parent/child interactions, and 3) discussions occur between the parent and practitioner, including parent education. The ratio of these three interactions varies depending on the child’s level of interest, the parents’ comfort level, the parents’ learning style, and the needs of the family on that particular day.

Direct intervention includes activities typically seen during any early intervention session, such as book sharing, listening activities, or turn-taking games. Telepractice requires the practitioner to adapt activities to be interactive. For example, in eliciting responses to an auditory awareness task, the practitioner might present the sounds via the videoconference speakers while the parent acts as a distracter. If the child is a new listener and the audio signal is not clear enough to attract the child’s attention, the roles might be reversed, with the practitioner acting as distracter on the television while the parent presents the sounds for the child using live voice. Another tactic is to use separated but related resources, such as sending a play dough recipe but keeping the play dough ingredients to encourage the child to ask questions and give directions.

Parent coaching often begins with the practitioner modeling a specific activity for the parent, such as how to focus on language while dressing the child. For example, the practitioner might use a doll to demonstrate how to introduce specific vocabulary through listening before showing an article of clothing. The practitioner will then encourage the parent to try the activity with their child. The practitioner will observe the parent, providing encouragement and feedback during and after the activity. Alternatively, the parent might demonstrate a favorite activity from home while the practitioner observes and provides suggestions for emphasizing the child’s goals within the activity. In either scenario, the parent and practitioner will discuss what worked, what did not work, and how to improve that routine during the upcoming week.

Parent education initially focuses on helping families to understand their child’s hearing loss, including how to read the audiogram and interpret audiological reports. The RIDBC practitioner
will focus on teaching the parent how to develop the child’s listening and spoken language skills in everyday routines as well as through specific listening and language activities. Every telepractice session will include specific parent education topics and informal parent education in relation to the child’s goals or to questions raised during the session. Each session concludes with a review of the activities completed and the child’s progress towards his or her goals. The parent and practitioner discuss which activities and goals to focus on in the upcoming week and how to generalize those goals to other activities in the child’s daily routines.

Implementation of Telepractice

To illustrate the additional considerations that must be taken into account in telepractice, the following scenario describes one activity as it would occur in person, and then the same activity as it would occur in telepractice. The aim of this particular early intervention activity is to target specific language structures, practice speech goals, and encourage metacognition skills. The task is a typical memory game using vocabulary picture cards.

In Person Delivery

In preparation for the in person session, the practitioner gathers a set of picture cards from her resources. She purposefully chooses cards to target a particular speech sound for the child, such as /p/ in the initial word position. The practitioner considers the child’s ability to persist with this speech task and decides to choose eight pairs from a pack of twenty pairs, to provide a sufficient number of practice attempts without placing undue pressure on the child or causing frustration. The practitioner introduces the task to the parent, relating the activity to the child’s current goals. The practitioner begins the task by asking the child to practice saying each of the words before placing the cards facedown on the table. As the game progresses, the practitioner notices that the child is struggling to remember where the pairs are located. The practitioner recognizes that removing some of the pairs will lessen the cognitive demand of the activity. The practitioner deftly removes three pairs from the table and resumes the game. During each turn, the practitioner monitors the child’s production of /p/, noting any error patterns, and uses specific strategies to refine and improve the child’s production. The game continues with the practitioner taking turns with the child and parent until all cards have been matched. The practitioner might comment on the child’s performance in the activity and suggest that the family play again during the week.

Telepractice Delivery

Consider how differently the practitioner must approach this activity in order to make it successful through telepractice. All of the implicit knowledge of the practitioner must be made explicit for the parent. The practitioner sends the word cards to the family ahead of time. The practitioner must clearly explain why this particular sound and words have been chosen. Depending on the parent’s learning style, the practitioner might provide this information in written form on the session plan, verbally discuss the information on the phone, or direct the parent to a web-based video, which demonstrates the information. The practitioner explains why it is important not to use all of the pairs at first, and provides clear instructions for selecting a limited set of cards. The practitioner must explain why the child needs an opportunity to practice the words before beginning the game, how the parent can provide that practice, and specific strategies for introducing the words and setting up the game. The practitioner monitors the game as the parent and child work together and if the practitioner notices the child is struggling, she provides the parent with an understanding of the child’s signals and provides a specific suggestion for simplifying the game. The practitioner provides comments and suggestions to assist the parent to monitor and refine the child’s speech production. If the practitioner is participating in the game, an
additional set of cards might be needed or the practitioner might direct the child or parent to take a turn for her with their cards. Either scenario requires forward planning and negotiation. After all cards have been matched, the practitioner and parent might discuss which parts of the game were successful, and which were more challenging for the child. The practitioner and parent would discuss ways to modify the game and how to utilize the cards for practice throughout the week.

**Conclusion**

ASHA (2005a) outlines 11 key domains of knowledge and skills that practitioners should possess before undertaking telepractice. RIDBC Teleschool has integrated these 11 areas into a large-scale, national telepractice model. In addition, RIDBC Teleschool has discovered other areas that assist practitioners in provision of high quality services via telepractice.

Telepractice is a continuously evolving discipline, with new technologies emerging regularly. While this can be intimidating, effective use of telepractice provides opportunities to develop new professional skills, reflect on current practices, and adapt traditional models of service delivery. Practitioners should incorporate the ASHA guidelines as a foundation for telepractice, develop relevant agency-specific skills, and modify individual teaching behaviors to maximize the benefit of the unique telepractice context.
References


CEU Questions for McCarthy
Using ASHA guidelines to establish a telepractice service: The RIDBC Teleschool experience

1. Which of the following activities can NOT occur via telepractice?
   a. Assessment
   b. Direct intervention with the child
   c. Coaching and guiding the parent
   d. Rapport building
   e. Physical interaction between the practitioner and the child

2. Why might it be preferable for families/clients to use an existing studio for telepractice?
   a. Equipment at an existing studio is readily available and reliable.
   b. Studios always have childcare facilities.
   c. Children behave more appropriately at a studio.
   d. It is more convenient for families to use a studio than their homes.
   e. Telepractice should never be delivered in a home.

3. A strategy for effective telepractice is:
   a. Interacting only with the child and not the parent.
   b. Transferring skills and knowledge to the parent.
   c. Sitting off-camera for the entire session so the child cannot see you.
   d. Leading every activity in the session.
   e. Speaking loudly.

4. All of the following are skills needed in telepractice, EXCEPT:
   a. Flexibility to adapt to unexpected circumstances.
   b. Aptitude for using technology.
   c. Significant training and experience in the content area.
   d. Technical expertise in computer programming.
   e. Time management and organizational skills.
Abstract

This article summarizes the results of interviews of 31 patients with voice disorders who participated in voice rehabilitation in one of two conditions: either face-to-face at a large urban medical center or via telepractice at two remote sites, one over 3000 miles away from the primary investigator. Other interviews were conducted with on-site and remote site coordinators and physician supervisors. Seven themes were highlighted in the interviews, including overcoming organizational barriers, developing telepractice protocols, treatment outcomes, clinical flow, response to telepractice experience, technology issues, and psychological barriers for patients, SLPs, and physicians. Patient perspectives confirmed what quantitative data had previously shown, namely, that outcomes for face-to-face and remote voice therapy delivery were equivalent.

Keywords: telepractice, voice therapy, voice disorders, patient satisfaction

Learning Objectives

1. Upon completion of this learning experience, the participant will be able to discuss the range of research supporting the application of telepractice to speech-language pathology services.

2. Upon completion of this learning experience, the participant will be able to explain the importance of using qualitative methods in addition to quantitative methods to explore the perceptions of clients (inside out perspectives) regarding telepractice services.

3. Upon completion of this learning experience, the participant will be able to enumerate the seven primary themes that clients and professional personnel focused on in interviews conducted during and after their telepractice experiences.

The views expressed in this article are those of the authors and do not reflect the official policy or position of the Department of the Army, Department of Defense, or the U.S. Government.

Over the past ten years, there has been a significant increase in the use of telehealth technologies to deliver speech-language pathology services to individuals in health care facilities, schools, and work, university, community, and home settings. The purpose of telehealth is to improve access to care and increase availability of services. According to research articles and anecdotal reports, adults and children with disorders in speech, language, or swallowing have received services via telepractice that would otherwise not have been available because of several factors, including a lack of speech-language pathologists (SLPs) in geographic areas, personnel shortages, distance from health care facilities, or lack of transportation. For some individuals, telepractice provides access to supplemental services in their homes or local schools.

The literature provides support for the benefits of telepractice (American Speech-Language-Hearing Association [ASHA], 2005a; Brady, 2007; Brennan, Georgeadis, & Baron, 2002; Brown & Carpenedo, 2006; Carpenedo, 2006; Georgeadis & Brennan, 2003; Mashima et al., 2003; Theodoros, 2011; Tindall, Huebner, Stemple, & Kleinert, 2008). Improved accessibility to services via distance technology can reduce or eliminate travel time and inconveniences associated with travel, such as availability of transportation, the need for family members to take time away from their work to transport a patient to therapy, parking problems, and difficult or risky access...
during inclement weather. Improving access to services may enable patients to participate in therapy on a more regular basis, may increase compliance, and thus may improve clinical outcomes.

Telepractice enables clinicians in home health agencies to cover a larger geographic area and increase the amount of services provided because of the elimination of travel time (Brady, 2007). Post-stroke patients with impaired mobility can receive therapy in their homes. Early intervention or home-based services can be provided in the least restrictive environment. Rehabilitation can incorporate a more functional approach by establishing behaviors and skills in the context of daily activities, existing routines, and natural interactions with family members and caregivers in the home.

Telepractice offers the potential of reducing the wait period for services provided by specialists (Brown & Carpenedo, 2006), and allows for closer monitoring to determine when additional services may be needed, as in the case of disease progression. Sub-acute patients with restorative potential can benefit from daily intervention with the use of adjunct telepractice treatment to supplement in-home visits. Follow-up services via telepractice after discharge from intensive or inpatient treatment can enhance functional outcomes. Individualized programs can be implemented to facilitate carry-over of newly learned skills in the home environment and increase involvement of family members and caregivers.

Telepractice facilitates access to university medical centers for specialty consultations that benefit both patient and clinician (Georges, Potter, & Belz, 2006; Jin, Ishikawa, Sengoku, & Ohyanagi, 2000; Perlman & Witthawaskul, 2002). This has been shown to be particularly advantageous for clinicians who practice in rural environments who have limited opportunities to interact with colleagues for professional growth and skill development. Grogan-Johnson, Alvare, Rowan, and Creaghead (2010) used questionnaires to evaluate stakeholders’ satisfaction with school-based telepractice services in rural Ohio. Surveys of students, teachers, administrators, and families showed most were satisfied or highly satisfied with telepractice services.

Despite a substantial body of literature advocating the use of telehealth/telepractice in a variety of venues by a range of medical specialists, questions persist about the quality of telehealth services delivered remotely (Krupinski et al., 2006). This is due in part to the preponderance of anecdotal reports and a scarcity of large randomized controlled studies. The existing literature on telehealth applications in speech-language pathology consists of preliminary investigations and demonstration projects, with an increase in published research over the past ten years (Hill & Theodoros, 2002; Mashima & Doarn, 2008; Theodoros, 2011). With the rapid advancement of technology and the enhanced interest and activity in telepractice, additional evidence is needed to support the incorporation of telepractice services into routine business practices and standard clinical protocols across the continuum of care, and to promote its long-term acceptance (ASHA, 2010). We are beginning to see acceptance of speech-language pathology telepractice by third-party payers, as in the recent decisions in Virginia and Vermont to reimburse through Medicaid for services delivered via telepractice. This brings to 12 the total number of states that considers telepractice in school settings to be an appropriate therapeutic option (Brannon, 2012a; 2012b). (Editors’ Note: Ohio is among the first states to allow for Medicaid reimbursement for school-based services delivered via telepractice, in part because of research sponsored by the Ohio Department of Education. School telepractice services are discussed by Grogan-Johnson in this issue.)
Qualitative Research in Telehealth

Quantitative measures are typically used to analyze the clinical outcomes of services delivered at a distance. Comparisons are often made between “in-person” and “remote” groups to determine if telepractice methods, procedures, and techniques yield outcomes that are consistent with standards of best practices for traditional, in-person delivery. In fact, the majority of telehealth research, even in speech-language pathology and audiology, has had a technological focus, yielding information about bandwidths and resolution, while knowledge about the human dimension remains sparse (Mair & Whitten, 2000).

According to MacFarlane, Harrison, and Wallace (2002), qualitative research can complement quantitative studies of telepractice to enhance understanding of organizational issues and interactive processes. Aas (2000) examined the organizational effects of telepractice by using qualitative interviews to obtain empirical data. Participant responses provided valuable insights regarding the organizational consequences of telepractice, including changed mechanisms for internal coordination, restructuring, differential flow of patients through the health care system, improved coordination of care, new job descriptions, and relocation of the place of work.

Wallace et al. (2002) conducted a randomized controlled trial of over 2,000 joint teleconference consultations. They concluded that their quantitative findings left many important questions unanswered and did not provide insight into how patient satisfaction could be maximized and dissatisfaction minimized in new telehealth initiatives. In a follow-up qualitative study, the investigators used semi-structured interviews to explore patient perceptions with particular reference to the reasons underlying and the factors contributing to patient satisfaction and dissatisfaction with telepractice (Harrison, MacFarlane, Murray, & Wallace, 2006).

Hopp et al. (2006) conducted qualitative interviews to examine the perceptions of direct providers of telehealth services, primary care providers, and hospital administrators in a network of Veterans Health Administration hospitals. In addition to themes related to both opportunities and barriers to the implementation of telehealth services, results of the study suggest strategies to improve future development and increase provider acceptance of telehealth services.

These studies confirm that while it is important to determine technological specifications and evaluate clinical effectiveness for telehealth applications, human factors research also needs to be explored to assess the impact of telehealth technologies from the perspectives of users (Krupinski et al., 2006).

Lessons Learned from Participants in a Telepractice Protocol

This article highlights qualitative findings from a study that analyzed attitudes and perspectives of 31 male and female participants, ages 25 to 70 years, who completed a telepractice vocal rehabilitation protocol. Treatment conditions were either on-site (i.e., in person) at a large urban medical center, or via video teleconferencing (VTC) between the urban medical center and a rural satellite clinic (26 miles from the medical center, requiring 45 to 75 minutes travel time), or at an overseas location (3,963 miles from the medical center, requiring an 8.5-hour flight and 2-hour land travel). These data were part of dissertation research completed by the first author (see Acknowledgements).

A blending of qualitative and quantitative methods was used to enhance understanding of telepractice from multiple frames of reference. Quantitative comparisons included pre- and post-treatment data on 1) patient self-rating on the Voice Handicap Index (Jacobson et al., 1997); 2) auditory-perceptual ratings of voice samples; 3) visual-perceptual ratings of video endoscopic
laryngeal exams; and 4) acoustic measures of noise-to-harmonic ratio. There were no significant differences between the 12 participants who received voice therapy in person and the 19 participants who received therapy at a distance via interactive VTC.

As a second evaluation procedure, qualitative interviews were used to explore participants’ opinions and to record descriptions of their experiences with vocal rehabilitation via telepractice. Triangulation was used to gather and compare multiple perspectives on telepractice services from the 19 patients who received therapy remotely and from the project coordinator and referring physician at the overseas site, and from the principal investigator. Written annotations were compiled along with interview transcripts for analysis, all in order to deconstruct the perspectives of participants in different roles. Questionnaires completed by patients and interviews conducted by the remote site coordinator and the principal investigator focused on eliciting overall impressions, including satisfaction and comfort receiving therapy via VTC. Results were compared with the existing literature. Meaning was constructed from reports of 1) participants’ experiences; 2) highlighted perceptions of care provided remotely; 3) patient and provider satisfaction; 4) clinical outcomes; and 5) relevant operational and technological issues. Recommendations based upon “lessons learned” are provided in this article to help SLPs who may be interested in initiating telepractice. Quotes from interviews with participants, including the patients, the remote site coordinator, and the remote site physician, are provided in the sections that follow. Single-spaced quotations highlight the comments, and italics are used to show the source of the comments. If the comments are from a patient, numbers and letters follow the quote and source.

The sections reflect the predominant themes that emerged from coding the data, namely 1) overcoming organizational and administrative barriers; 2) developing a telepractice protocol -- fulfilling a need to improve access to services; 3) patients’ response to telepractice delivery of voice therapy; 4) treatment outcomes; 5) integrating telepractice into clinic workflow; 6) technology recommendations; and 7) overcoming psychological barriers -- perspective of the clinician/primary investigator.

**Overcoming Organizational and Administrative Barriers**

To ensure success when initiating a speech-language pathology telepractice program, it is critical to gain the support of stakeholders, including clinicians, administrators, patients, sponsors/payers, technical support staff, and facilitators (ASHA, 2010). In fact, inclusion of telehealth initiatives in an institution’s strategic plan is highly recommended to affirm administrative approval and commitment, including allocation of resources to support implementation and sustainment (Scheideman-Miller, 2004; Tracy, 2004). In the present study, Institutional Review Board approvals, coordination among the three sites to initiate services, and personnel contracts that required execution across funding agencies added to the complexity and resulted in start-up delays.

Years of administrative preparations were necessary to approve the telehealth project; therefore, some individuals initially committed to the project had transferred or no longer could provide the designated time to complete the study….Conflicts in contract for the site person caused further delays in initiating the project.” *(source: remote site coordinator)*

Based upon ethnographic studies of the development, implementation, and evaluation of telehealth systems and services, May et al. (2003) identified four conditions necessary for embedding telepractice as a routine means of service delivery 1) link with a policy agency to sponsor effective implementation with the development of infrastructure and allocation of resources; 2) integration and incorporation of telepractice into existing structures of health care
delivery within organizations; 3) cohesive network of personnel fully engaged in operationalizing the telepractice system; and 4) integration of telehealth models of clinical practice into existing methods of working with patients to support clinicians in learning and deploying new knowledge and skills required to meet the demands of the new mode of service delivery. Operational context was highlighted as a crucial variable in this study, including the complexity of integrating and stabilizing telepractice services into routine organizational processes and traditional modes of professional practice. Administrative and organizational tasks (i.e., executing a personnel contract and establishing networks at the remote site to support the project) can be the most daunting obstacles, even surpassing the challenge of overcoming geographic distances.

Developing a Telepractice Protocol: Fulfilling a Need to Improve Access to Services

In order to maximize the success of a telepractice application, its purpose should be based upon an identified need to improve health care services (Brebner, Brebner, & Ruddick-Bracken, 2005; Burgess et al., 1999). The theme that telepractice expands treatment options when there is a lack of physical presence of specialists was reinforced in participants’ comments in the present study. Patients were referred for therapy via telepractice because they did not have equal access to services. Their comments highlight the benefits of the telepractice model in meeting the needs of individuals in rural areas with logistic as well as geographic challenges. The advantages cited include time savings and convenience of access for patients with demanding schedules, and cost savings in eliminating the need for air travel.

Patients not qualifying for Med-evac would not have been able to receive services had it not been for this project. (source: remote site coordinator).

There is a disadvantage when one (SLP) is needed but the VTC serves the purpose. (source: referring physician at remote site as reported in interview with remote site coordinator).

Telehealth is an excellent way to get medical care to remote locations. (source: subject t20 as reported on written survey).

Advantage is that no (overseas) travel is involved. (source: subject mm39y as reported in interview with remote site coordinator).

It’s (a) very good program and it’s cost effective (for) both patients and hospital. (source: subject mm39y as reported in interview with remote site coordinator).

She feels that telehealth saves $$ in medical expenses. (source: subject ll38y as reported in interview with remote site coordinator).

Definitely cost benefits and time efficiency to stay in country. (source: remote site coordinator).

Example of patient with transportation challenges. For a patient at the rural satellite clinic, telepractice voice therapy was recommended by the referring physician and perceived as a low-risk option and desirable alternative to surgical intervention for hoarseness and vocal nodules. While her personal commitments and schedule demands conflicted with taking time to commute to the large urban medical center for therapy, vocal rehabilitation was critical to her classroom teaching. She elected to receive therapy via VTC at the rural satellite clinic.

It’s very convenient; it’s 10 minutes versus 40, 50 minutes from (urban medical center); finding parking and going up and sitting in the waiting room is a lot of time and therefore I would have to take time away from class and ask my principal for time off…. Telehealth saved me time on the road due to traffic… the flexible appointment time was also great. It allowed me not to miss any time out from work. (source: subject u21 as reported on written survey and in interview with primary investigator).
After four months, the patient was discharged from therapy with resolution of vocal nodules and hoarseness.

**Patients’ Response to Telepractice Delivery of Voice Therapy**

Telepractice services were perceived positively by patients involved in this study; no insurmountable challenges were reported.

(Receiving therapy remotely) I felt did not inhibit my care at all. I cannot say anything bad about it because I’ve had only positive experiences; there has been no negatives. *(source: subject u21 as reported in interview with primary investigator).*

I felt very comfortable with the telehealth sessions and was able to communicate easily with my speech pathologist. *(source: subject a1 as reported on written survey).*

I really enjoyed it. Thought it was cool. *(source: subject ll38y as reported on written survey).*

There is no constructive criticism to report. This was an extremely helpful and valued experience. *(source: subject l12 as reported on written survey).*

Excellent care and very professional staff!!! *(source: subject y25 as reported on written survey).*

Real-time interaction was slightly compromised due to the slight delay in transmission after a person speaks. Patients quickly adjusted to the delay. *(source: remote site coordinator)*

Comparisons of receiving therapy remotely versus in-person suggest that telepractice delivery was perceived positively, although not necessarily equivalently. I do not think the outcomes would have been significantly different for patients had (clinician) been face-to-face. The only other concern was the inability to use hands-on techniques that may have aided some patients.” *(source: remote site coordinator).*

Not like face-to-face, but quickly became comfortable with the set up. Felt comfortable that it was 1:1 with (clinician). *(source: subject mm39y as reported in interview with remote site coordinator).*

One of the patients who received therapy at the overseas remote site via VTC relocated because of her work assignment and continued her voice therapy at the urban medical center where this study was conducted. When asked to compare her perceptions of remote versus in-person therapy, she described:

The VTC (therapy was) more effective… because I remember being more focused; I was your only audience, and you were my instructor. There were no distractions…I just remember being more prepared…there was a sense of more clarity, I was ready to go… I remember watching the screen and I had no problem following you, the breathing, the patterns, the techniques…and I just seemed to be more in tune. I had what was called, and sometimes people talk about how tunnel vision is a negative thing but I think in this case it was very positive. Because I could see nothing else but my experience when I was on VTC, and now I’m…I see you, I see the experience but I see everything else, it’s like a panoramic picture. Then I had more of a snapshot close picture so I was more engaged, just seemed that way…. I was committed to the time, it was on my schedule, it never changed unless you changed it but…it was a blueprint, it was set in stone, pretty much. So I know when I was going to study, I knew when I was going to prepare, and there it was. *(source: subject qq43y who received therapy via VTC at the overseas remote site and in-person at the urban medical center).*

Since VTC sessions were scheduled in advance and involved coordination and connection between the two sites, the patient felt committed to keeping her appointments in spite of conflicting work assignments. After she relocated,
work-related demands often interfered with compliance, for example, scheduling regular appointments at the urban medical center.

Treatment Outcomes

ASHA’s (2005b) position is that “the quality of services delivered via telepractice must be consistent with the quality of services delivered face-to-face”. Telepractice applications require assessment of relevant outcome data. Scientific peer-reviewed publications such as the Journal of Telemedicine and eHealth and the Journal of Telemedicine and Telecare include empiric studies conducted by SLPs that conclude that there were no differences in diagnostic accuracy and the ability to treat and produce evidenced-based outcomes when services were delivered via telepractice versus in person (Grogan-Johnson, et al., 2010; Hill, Theodoros, Russell, & Ward, 2009; Palsbo, 2007; Theodoros et al., 2006; Theodoros, Hill, Russell, Ward, & Wootton, 2008; Tindall et al., 2008).

In this study, in addition to quantitative data that indicated no significant difference between outcomes of therapy delivered in person and remotely via VTC, the following samples of qualitative data support telehealth:

I’m all for media therapy…the techniques work. (source: subject u21 as reported in interview with primary investigator).

(Clinician) was extremely informative and (gave) excellent advice contributing to an overall improvement in my voice awareness and vocal health. (source: subject oo41y as reported on written survey).

She reported that her singing voice is back to her normal ability!!! (source: subject pp42y as reported in interview with remote site coordinator).

Pre and post test outcomes measures were positive… Patient improvement for the majority of patients. (source: remote site coordinator).

Felt there were no negative issues with the actual patient care side of the project. He received no negative feedback from the patients in the voice study…He felt that the project ‘was effective in meeting patient care.’ (source: referring physician at remote site as reported in interview with remote site coordinator).

The coordinator at the overseas remote site contacted four patients at 4.5 months after their discharge from therapy. She reported that patients maintained levels of improvement in their vocal function as well as compliance with their treatment regimen, including use of facilitating voice techniques and vocal hygiene strategies.

Voice sounded strong and clear; when asked about good vocal hygiene practices she said she continues to drink lots of water. (source: subject ll38y as reported in telephone call with remote site coordinator 4.5 months following discharge from therapy.)

She was getting over another bout with allergies, but her voice quality actually sounded strong and only mildly hoarse. (source: subject mm39y as reported in telephone call with remote site coordinator 4.5 months following discharge from therapy).

Normal vocal quality; sounded strong. She indicated that she is learning not to yell to help her maintain good vocal quality. (source: subject oo41y as reported in telephone call with remote site coordinator 4.5 months following discharge from therapy).

Normal voice quality has been maintained and she is pleased about that. (source: subject pp42y as reported in telephone call with remote site coordinator 4.5 months following discharge from therapy).
Integrating Telepractice in Clinic Workflow

Telepractice services should be integrated into existing organizational processes (ASHA, 2010). Workload, documentation, and reimbursement issues should be addressed prior to initiating telepractice, including verifying insurance coverage for patient encounters via telepractice and fulfilling documentation and coding requirements to bill payers for specific procedures delivered via telepractice. Providers should seek guidance on regulatory issues to ensure compliance with licensure and credentialing requirements.

Scheduling telepractice sessions requires planning and organization. Variables include accommodating schedules of participants (clinician, patient, family members, caregivers, interpreters, multidisciplinary team members, teachers, aides, on-site facilitators), scheduling rooms and equipment across multiple locations and time zones, coordinating access to required resources and technical support if needed, and considering optimal network “traffic” times (i.e., impact on quality of transmission). Potential challenges identified by the remote site coordinator included:

...coordinating therapy appointments when there is a significant time difference between the two sites; which site to coordinate securing bridge time... If the VTC equipment and room are shared with other disciplines, naturally it is crucial to coordinate scheduling of the room... If regular patient use of the VTC room for a particular discipline is needed, specific day(s) of the week with time slots should be established between the two sites and coordinated with the remote site's patient appointment processing system... Weekly time slots to connect to VTC and with fastest bandwidth transmission were not guaranteed. Although this was not a major problem during the study, it can be a significant issue. (source: remote site coordinator).

Technology Recommendations from Professionals

Technical experts should be consulted and usability simulations should be conducted in the process of selecting telepractice equipment (e.g., VTC system and peripheral devices) and determining connectivity specifications (e.g., bandwidth and transmission speed) to ensure robust and reliable support of the clinical application. In addition to having available technical support when needed, basic provider training on use of equipment and establishing connectivity should be conducted on an ongoing basis to increase confidence and skill in troubleshooting as problems arise. For example, technology must be carefully considered when there is a need to record and transmit samples of acoustic parameters of a patient's voice, since some computer output devices may not permit the best quality recordings.

At least one designated individual is needed to establish and coordinate a support system at the remote site, e.g., to learn and/or teach use of the telecommunication equipment in conjunction with the computer software... (source: remote site coordinator).

Standard operating procedures should include alternatives for establishing or re-establishing connectivity in the event that the primary option should fail (e.g., telephone or e-mail as back-up if VTC system malfunctions).

Technical difficulties (were) not a significant issue, but can be worrisome to the clinician and the on-site coordinator. An established back-up system with a dependable person(s) at the remote site is crucial, e.g., person with knowledge of the equipment to troubleshoot... telephone contacts at both sites, flexibility of the clinician to change therapy session format to audio only e.g., telephone conference (so a speaker phone feature in the room is important), etc.; lots of trial and error in the beginning! (source: remote site coordinator).
Multi-use of a VTC system (e.g., by multiple disciplines for multiple functions) should be considered in building a business case for telepractice (e.g., cost-benefit analysis for initial investment and sustaining of telehealth services (Brebner et al., 2005). In fact, after the VTC equipment was acquired and installed at the overseas remote site through our telepractice voice project, the hospital staff implemented clinical applications by providers in other disciplines, including counseling.

My impression is that the voice project provided the hospital with its Telemedicine Room equipment with which they are pleased to have established a beneficial health care service delivery mode…the Telemedicine Room is being well utilized with the hospital branch clinics. (source: remote site coordinator).

Sensitivity to individual patient’s preferences and perceptions is vital to success when incorporating the use of technology into clinical practice. While at the outset several participants in the current study embraced telepractice as an innovation in health care, others recalled feeling apprehensive; however, these participants expressed reassurance after their initial telehealth session.

This technology when I was asked to do this research was something that I was excited about doing. (source: subject u21 as reported in interview with primary investigator).

The only thing that was ever a problem was set-up, and that was minor. (source: subject t20 as reported on written survey).

First session uncomfortable (analogy of going to see a new doctor and not knowing what to expect). Felt at ease with her therapist and by second session process became very natural. No negative thoughts regarding VTC model of therapy. (source: subject qq43y as reported in interview with remote site coordinator).

She became very comfortable with the long distance mode after a short while, stating that “she didn’t think anything of it.” (source: subject nn40y as reported in interview with remote site coordinator).

**Overcoming Psychological Barriers: Perspective of the Clinician/Primary Investigator**

In addition to overcoming geographic barriers to care, proponents of telepractice have often cited the need to overcome psychological barriers that may include reluctance on the part of health care providers to venture away from in-person encounters with patients. In fact, Hopp et al. (2006) consider provider satisfaction as a key component of successful deployment of telepractice applications, since the distance mode of delivering services often necessitates modification of approaches, methods, and techniques. It is reasonable to expect challenges in departing from the comfort and ease of conducting business as usual. A source of initial uncertainty may be the anticipation of establishing a therapeutic alliance with patients at a distance. Thus, it is critical to be sure that there is a qualified professional at the remote site who can provide support, at least initially, to the patient. When interacting via VTC, clinicians are often concerned about lacking the “human factor” that is present with in-person encounters. Participants in this study reported that their therapeutic relationship with the clinician was not compromised by the use of technology. While clinical procedures needed to be modified and adapted to accommodate for the lack of physical contact, treatment effectiveness was not compromised in providing services remotely, as evidenced by the quantitative analyses of data. The success of this particular model depended on a reliable on-site coordinator.

In anecdotal reports, personnel at remote or rural sites reported gaining knowledge and experience and increasing their diagnostic confidence through participation as remote site coordinators. Videoconferences with patients and specialists enabled them to manage more complex situations and
become less reliant on expert consultation (Jarvis-Selinger, Chan, Payne, Plohman, & Ho, 2008). An unanticipated but important outcome of this study was professional development. When we recruited the SLP who served as our remote site coordinator, she initially was hesitant because she did not feel comfortable or confident in treating voice disorders. She agreed to participate when her role as coordinator rather than voice clinician was defined. In the course of observing and assisting with telepractice therapy sessions, she quickly acquired knowledge, skills, and clinical competence in assessing and treating patients with voice disorders.

During my participation in the study, an unexpected positive outcome emerged with the use of VTC as a tool for mentoring. Under (clinician)’s guidance, my skill base in voice evaluation and therapy increased significantly. Not only did I learn from observation of (clinician)’s therapy sessions, I had the opportunity for long distance learning in other aspects. Use of telehealth was a great mentoring experience for me. (source: remote site coordinator).

Reciprocally, the remote site coordinator consulted on her subspecialty, augmentative and alternative communication devices with an SLP in our urban medical center. Professional development that served to address the needs of patients at both sites was a mutual benefit achieved by utilizing the VTC system.

Summary

Qualitative methods of inquiry enhanced understanding of the quantitative comparisons of treatment outcome data obtained in this study. The telepractice model was effective in yielding desirable clinical outcomes and in overcoming barriers to care despite the need to address administrative, operational, and technical issues to facilitate successful deployment.

The potential for expanding telepractice services for SLPs is significant in light of the decreasing costs of telecommunications technologies and devices, more widespread connectivity, personnel shortages, and increasing demand for home health care. While ASHA supports the use of telehealth to overcome barriers to accessing SLP services, lack of reimbursement for this method of delivery has impeded widespread implementation (Brown, Brannon, & Romanow, 2010). Data are needed to expand the evidence base for SLP telepractice services, to document cost savings across sectors (e.g., health and human services, dependent care, education, business), and establish public policies to promote the continued growth and development of telepractice. With support of outcome data, telepractice applications can be integrated into routine SLP clinical and business practices to enhance existing services and improve access to care. Although quantitative studies on the development and implementation of telehealth systems inform us about clinical efficacy and cost-effectiveness, qualitative studies inform us about how achieving these outcomes affects the clients’ perceptions. We can identify the professional, organizational, and human factors that promote those positive outcomes, or offer evidence about how to address these issues and problems (May et al., 2003).

Acknowledgements

This research was a portion of the first author’s dissertation submitted for a Ph.D., in the Department of Communication Sciences and Disorders at the University of Cincinnati. Lisa Kelchner, Ph.D., was her dissertation advisor and Laura Kretscher, Ed.D., was a committee member. The first author wishes to thank the additional members of her dissertation committee, Peter Scheifele, Ph.D., Department of Communication Sciences and Disorders, University of Cincinnati, Charles Doarn, MBA, Director of Telemedicine, College of Medicine, University of Cincinnati, Michael Holtel, M.D., Sharp Rees-Stealy Medical Group, San Diego.

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References


CEU Questions for Mashima, Kretschmer, and Kelchner
Lessons Learned from Patient Perspectives on Voice Therapy via Telepractice

1. The advantages of telepractice include all the following EXCEPT:
   a. Enables clinicians to cover larger geographic areas
   b. Telepractice is routinely reimbursed by health insurance agencies
   c. Improved accessibility to services from patients with impaired mobility
   d. Eliminates issues with travel to obtain services

2. The current article reports qualitative findings on the following sample of clients:
   a. Children with voice disorders
   b. Adults who completed rehabilitation for swallowing disorders
   c. Adults who completed voice rehabilitation, some of which were over 3000 miles away from the telepractice site
   d. Adults who completed voice rehabilitation in a large medical center
   e. Both c & d.

3. Quantitative analysis reported for this sample showed:
   a. There were no quantitative results reported in this study.
   b. In-person vocal rehabilitation yielded better perceptual results than those who received telepractice services
   c. Telepractice service yielded better perceptual results than those who received in-person vocal rehabilitation
   d. There were no significant differences in quantitative measures between those who received in-person versus telepractice services.

4. Which of the following themes was NOT identified by the participants as important in their surveys?
   a. Overcoming organizational and administrative barriers
   b. Patients’ response to telepractice delivery
   c. Patients expressing lack of confidence in efficacy of voice therapy
   d. Overcoming psychological barriers of co-clinicians in delivery of service
   e. Satisfaction with treatment outcomes

5. Which of the following could be considered important outcomes of this research?
   a. Client perspective is a critical piece of judging the success of new approaches to therapy delivery.
   b. Both the researcher and the remote site coordinator gained professional knowledge as a result of the project.
   c. The remote site hospital benefited from being able to use the Telemedicine Room for other applications.
   d. Some remote clients were apprehensive about telepractice but were comfortable after their initial sessions.
   e. All of the above
Abstract

This article describes a clinical training model designed to train speech-language pathology graduate students in the use of live, interactive video-conferencing methods to provide speech-language assessment and intervention services to school-age children with communication impairments. A description of the training protocol and equipment and technical needs is provided.

Keywords: graduate students, training model, telepractice, school-aged, speech-language pathology

Learning Objectives

1. Identify requisite skills needed to provide speech-language therapy services via telepractice.
2. Recognize the component parts of a clinical training program in telepractice for graduate students.
3. Identify clinical preparation training materials for instructing graduate level clinicians on the use of telepractice.

The explosion of new, sophisticated, and user-friendly communications technologies has thrust telepractice into the limelight for speech-language pathologists (SLPs). SLPs are increasingly turning to technologies such as the Internet and videoconferencing for service delivery (Dudding & Justice, 2004). Technological innovations will continue to affect clinical practices (Hallett, 2001) and it is important to prepare graduate students in speech-language pathology to integrate themselves into this rapidly changing clinical environment.

The Speech Pathology and Audiology Department at Kent State University (KSU) hosts a telepractice project that provides speech-language therapy services via live, interactive videoconferencing to children with communication impairments in two rural public school districts in Ohio. Along with the direct service provision, the project serves as a clinical training site for graduate students. This telepractice program offers an example of how graduate training programs can expand their number of clinical training sites, provide instruction in state-of-the-art technologies, and conduct research. While telepractice is gaining in popularity as a clinical service delivery model, this author is only aware of a few universities that provide explicit instruction to graduate students in the use of telepractice for the delivery of speech-language therapy services.

In this article, I describe the KSU telepractice project and outline the training and supervision of the graduate students who participate in the project as part of their clinical practicum experience. The student preparation is compared to the guidelines contained in the American Speech-Language-Hearing Association (ASHA) Knowledge and Skills Needed by Speech-Language Pathologists Providing Clinical Services via Telepractice document (ASHA, 2005). Also included is an overview of the technology and equipment currently in use.

Background

Speech-language therapy services in Ohio public schools are typically offered by an on-site SLP who provides therapy on a weekly basis to small groups of children with communication disorders. The acute shortage of SLPs has resulted in some school districts being unable to provide the services needed for students with communication impairments. In 2006, the Ohio Department of Education (ODE) pulled together representatives from Ohio's Universities, the Ohio Board of Speech-Language Pathology & Audiology (OBSLPA), the Ohio Master’s Network Initiatives in Education (OMNIE), the Ohio Speech-Language-Hearing Association (OSHLA), the Ohio School
Speech Pathology Educational Audiology Coalition (OSSPEAC), and the Ohio Speech-Language Pathology and Educational Audiology Supervisory Network to form a task force to develop a plan to reduce these shortages. The group developed a program consisting of eight initiatives funded by the ODE (Boswell, 2007). One of the initiatives, a pilot telepractice project, would provide speech-language therapy services to students in rural school districts throughout the state using live, interactive video conferencing. The purpose of the pilot telepractice project was to collect data on students who receive telepractice services and attempt to determine if children make similar amounts of progress in speech-language therapy when they receive services via telepractice as compared to a more traditional service delivery model. Following is a brief overview of the telepractice project.

During the inaugural year of the project (2007-2008), one full time SLP provided telepractice speech-language therapy to 38 students in four rural school districts. A thorough description of the project and the results are reported elsewhere (Grogan-Johnson, Alvares, Rowan & Creaghead, 2010). During the second year of the project, the program expanded to two full time SLPs who provided telepractice services to approximately 80 students in five rural school districts. Results of a research project investigating the provision of articulation therapy via telepractice conducted during that year are reported elsewhere (Grogan-Johnson, Gabel, Alvares, Taylor, & Rowan, 2011). Bowling Green State University joined the project during the 2009-2011 school years and telepractice services were provided to approximately 200 students by three full time SLPs. During 2009-2010 the results achieved by the students who received services by telepractice were compared with the progress made by students in traditional service delivery settings, as reported by the ASHA National Outcomes Management System K-12 Schools (ASHA, 2008) (Gabel, Grogan-Johnson, Bechstein, Alvares, & Taylor, submitted for review). At the end of the fourth year of the project, funding from the ODE was discontinued. Bowling Green State University decided not to continue with the project. Now in its fifth year, the telepractice project is continuing at KSU with speech-language telepractice services provided to approximately 120 students in two school districts by one full time and one part time SLP. During the second year of the project, a clinical training component was initiated which provided graduate clinicians with direct instruction in how to provide speech-language intervention and assessment services via live, interactive videoconferencing. A description of this training program is described below.

**Clinical Training Model**

Each semester four to six graduate clinicians are accepted for the clinical training program in telepractice. The students are supervised by the telepractice SLPs, who hold a minimum of a Master’s degree in speech-language pathology, the ASHA Certificate of Clinical Competence, and licensure from the ODE and OBSLPA. Prior to initiating the actual clinical practicum, the students must participate in the general clinical preparation and orientation meetings conducted for the on-campus clinic. These meetings review health and safety regulations, clinic procedures, confidentiality measures, and training. The students are required to observe a telepractice session. Initial training for the telepractice clinic consists of three training sessions. Table 1 describes each of the training sessions.

Following completion of the training, the graduate students participate in the telepractice clinical practicum site for one semester. Each graduate student is assigned two to three clients. For every therapy session, they receive direct supervision from the SLPs employed in the telepractice project.
Advantages of the Clinical Training Model

The clinical training program for telepractice speech-language intervention has many advantages as a clinical training site. Graduate students develop a unique, innovative skill set related to the provision of services through telepractice. They will enter the workplace with explicit training in skills that many practicing SLPs do not currently possess. Another important advantage is that the graduate students learn to manage back-to-back intervention sessions while still in their clinical preparation on campus. This is typically a skill that is developed later in their training during externship placements. Also, because the telepractice project is providing direct services to two public schools, the graduate students have an opportunity to work with students that would typically be found on a school SLPs’ caseloads, follow Individualized Education Plan (IEP) goals and objectives, and interact with classroom teachers. This experience facilitates the transition to a public school externship. Finally, implementation of the telepractice clinical training program permitted us to increase the number of clinical training sites for the graduate students at no additional cost to the department.

Disadvantages of the Clinical Training Model

The KSU telepractice project team predicted that a primary disadvantage of the telepractice clinical training program would be that the graduate students, who are typically still learning basic clinic management and intervention techniques, would be asked to learn additional skills related to the provision of telepractice services, resulting in excessive frustration and poor performance. For example, a typical graduate student placed in the telepractice project would still be learning to write effective lesson plans, organize and plan effective intervention sessions, accurately collect data, and develop appropriate interaction skills with their clients. In the telepractice training program the graduate students must also learn to effectively utilize the technology, research and find Internet-based activities or create activities for use in the sessions, and learn to cue productions and manage behavior without being physically present with the client.

Interestingly, this prediction was incorrect. To date, 20 different graduate students who ranged in experience from their first semester in clinical practice to their final semester have completed training. The graduate students readily learned the technology and successfully identified or created Internet-based activities. The clinical skills that are the focus of training in the telepractice project

<table>
<thead>
<tr>
<th>Table 1.</th>
<th>Telepractice Clinical Training Program: Initial Training Sessions for Graduate Clinicians</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Session</strong></td>
<td><strong>Description</strong></td>
</tr>
</tbody>
</table>
| Technical Training | Graduate students demonstrate basic computer skill competencies (see Appendix A)  
Review the Clinical Training in Telepractice guide and complete the technical training section (See Appendix B) |
| Therapy Materials/Methods | Review and discuss the clinic training fact sheet and resource guide (See Appendix C)  
Discuss assigned client and initial lesson plans |
| Practice Session | Practice videoconferencing with other graduate students |
are the same or similar skills that are focused on in the traditional service delivery model in the department clinic (e.g., accurate data collection, obtaining an adequate number of client responses per session, reinforcement techniques). It should be noted that 100% direct supervision for students in the telepractice training program is maintained. The telepractice SLPs are present in the room for every therapy session and directly supervise at least 50% of all therapy sessions. During the remaining period of time, supervising SLPs may be involved in other activities but are available to assist with any technological glitches or incidents that arise during the sessions. This degree of supervision is maintained in agreement with the public school districts to help ensure that their students are receiving high quality interventions.

The development of the telepractice clinical training program was guided by previous direct experience with telepractice and by the knowledge and skills for telepractice identified by ASHA (2005). While the ASHA skills and knowledge document is intended for practicing clinicians, a clinical preparation program should be based on these identified and accepted skills. The following section compares the knowledge and skills identified by ASHA and the telepractice clinical training program.

Comparison of the Telepractice Clinical Training Program with ASHA Telepractice Knowledge and Skills

In 2004, ASHA affirmed that SLPs can utilize telepractice technology for the provision of speech-language services as long as the services are comparable in quality to traditional on-site services (ASHA, 2004). The following year they published a skills and knowledge document to guide SLPs in developing adequate skills for providing services using this delivery model. In particular, ASHA asserted that practicing clinicians should have “detailed knowledge and skills in telepractice models, technology associated with service delivery, matching clients to technology, selecting assessments and interventions that are appropriate to the technology, cultural/linguistic variables, use of support personnel, evaluation of service effectiveness and documentation of services” (ASHA, 2005, p. 1).

The following table identifies skills for the SLP telepractioner and how those skills are incorporated into the current training program. This information may be helpful to SLPs or university faculty as they develop telepractice training programs. The interested reader is referred to the document ASHA Knowledge and Skills Needed by Speech-Language Pathologists Providing Clinical Services via Telepractice (ASHA, 2005) for additional information.

Technology and Equipment

Following is a description of the technology and software currently being used in the telepractice project. Selection of the equipment was based on availability, cost, ease of use, and specifications that matched the intended clients and purpose of the project. Technology utilized at the distant school sites includes Dell Inspiron XPS 410 desktop computer with Microsoft Windows XP operating system; 19” widescreen flat panel display; and the Logitech Quick Cam Orbit MP color web camera with built-in microphone and accompanying headset. An additional Logitech headset and Radio Shack brand audio splitter was installed at each site so that adult telepractice assistants, who escort the students to therapy, could listen to the therapy sessions as needed. (See Appendix B for a complete description of the telepractice assistants.)

Technology utilized at KSU includes Dell Inspiron 8500 laptop computer with Windows XP operating system or Dell Inspiron XPS 410 desk top computer with Microsoft Windows XP; Sharp AQUOS 22 “flat screen display; and the Logitech Quick Cam Orbit MP Color Web Camera with built-in microphone and accompanying headset.

Videoconferencing is conducted using the Microsoft Office LiveMeeting web conferencing application. This program permits simultaneous video and audio for the SLP and the client and permits data sharing or interactive sharing of websites, software
Table 2.
ASHA Telepractice Skills & Knowledge Comparison Chart

<table>
<thead>
<tr>
<th>ASHA Skill (ASHA, 2005)</th>
<th>Description of Skill (ASHA, 2005)</th>
<th>Correlates in KSU Training Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses of Technology</td>
<td>Recognizes various telepractice service options &amp; applies to current practice needs</td>
<td>Graduate students review the difference between synchronous and asynchronous applications during training session 1</td>
</tr>
<tr>
<td>Types of Technology</td>
<td>Understands functions and operation of various technology utilized for telepractice</td>
<td>Graduate students review software, web camera settings and control, Internet vs. software videoconferencing applications, general review of bandwidth, and other possible technology applications (e.g., email, phone conferencing) during training session 1 and during the course of the semester</td>
</tr>
<tr>
<td>Client Selection for Telepractice</td>
<td>Selects clients who are able to receive assessment and intervention services via telepractice.</td>
<td>This area is discussed with the graduate students during the course of the semester. Telepractice SLPs make this determination for the project and discuss their decision-making process with the graduate students.</td>
</tr>
<tr>
<td>Selection of Assessments &amp; Interventions</td>
<td>Utilizes technology to provide assessment and intervention</td>
<td>Graduate students review this information during training session 2 and throughout the course of the semester in working with their individual clients</td>
</tr>
<tr>
<td>Cultural/Linguistic Variables</td>
<td>Demonstrates sensitivity towards linguistic and/or cultural variables of clients</td>
<td>Graduate students review this information in their academic coursework and discuss it throughout the semester with the telepractice SLPs.</td>
</tr>
<tr>
<td>Use of Support Personnel</td>
<td>Trains and works with telepractice support personnel appropriately</td>
<td>Graduate students do not train the support personnel in the project. Support personnel are trained by the telepractice SLPs. Discussion of the role of the support personnel is covered in training session 1 and throughout the semester when incidents occur for instruction. (e.g., student asks support personnel for help with an answer)</td>
</tr>
<tr>
<td>Evaluation of Effectiveness and Outcomes</td>
<td>Identifies and applies methods to assess the effectiveness of telepractice services</td>
<td>The telepractice project is a research project. On-going studies investigate the effectiveness of the service delivery model. Students, parents and school staff complete satisfaction surveys. The graduate students are aware of these initiatives and discuss issues of evidence-based practice during the clinical experience.</td>
</tr>
<tr>
<td>Documentation</td>
<td>Documents differences between telepractice and traditional service delivery models.</td>
<td>This issue is discussed with the graduate students during training sessions 1 &amp; 2 and is discussed each year with the parents and faculty in the school districts.</td>
</tr>
<tr>
<td>Licensure, Liability &amp; Malpractice</td>
<td>Ensures that client and clinician are protected in the delivery of telepractice services.</td>
<td>Ohio licensure law permits the practice of telepractice. Students maintain liability insurance.</td>
</tr>
<tr>
<td>Reimbursement</td>
<td>Identifies sources for reimbursement</td>
<td>Ohio Medicaid reimburses for telepractice services provided in public schools. The graduate students observe Medicaid paperwork requirements.</td>
</tr>
<tr>
<td>Privacy/Security</td>
<td>Ensures patient confidentiality</td>
<td>Graduate students review clinic confidentiality guidelines in clinical training and understand signal encryption for telepractice provision.</td>
</tr>
</tbody>
</table>
programs, desktop, or documents. The video conferencing between KSU and the rural Ohio school districts is through a 10 Mb switched connection through KSU’s Optical Connection-3 to the Ohio Academic Resources Network (OARnet) to reach the T1 connection at the distance sites. The OARnet is an integrated technology infrastructure that provides support and services to all academic institutions including K-12 schools in Ohio. Student privacy is maintained through 128-bit AES Internet signal encryption that meets Federal Information Processing Standards (FIPS) and is HIPPA compliant.

**Conclusion**

This article described an innovative model designed to train speech-language pathology graduate students in the use of live, interactive video-conferencing methods to provide speech-language assessment and intervention services to school-age children with communication impairments. The necessary training components and technology necessary for this model of training were presented. This model allows graduate students to be adequately trained to implement speech-language therapy services using a telepractice service delivery model to children in a public school setting.

Future directions for the project include developing a graduate course in the application of telepractice to the professions of speech-language pathology and audiology. There are many fruitful avenues of research open in speech-language therapy telepractice. The project will continue to study the effectiveness of services delivered via telepractice as well as investigating the impact of telepractice training on the clinical performance and preparation of graduate students.

**References**


Appendix B

Clinical Training in Telepractice

Introduction

In the first section of the training, students learn the features of the equipment and software and gain experience in using the technology. In this section, students learn how to apply the technology to clinical service delivery.

Telepractice sessions have some similarities to therapy in the KSU Speech and Hearing Clinic. They are face-to-face and occur in real time. The clients are school-aged children with various disorders. Therapy goals, objectives and techniques are evidence-based. However, there are some differences that could lead to challenges. With preparation, students should be able to readily meet the challenges.

In addition to introducing students to telepractice as a service delivery model, another purpose of this training is to introduce students to managing a school-based caseload. Students will have either two or three clients, back-to-back, for 20 or 30 minutes. Students must be prepared, well in advance, for the consecutive sessions and to make sessions as productive as possible. Preparation includes having therapy plans submitted to and approved by the supervisor well in advance, as well as having data collection sheets ready to go.

Clinical Procedures

Attendance/Cancellation Policy

Graduate students are to notify supervisors if they are unable to provide services due to illness, and vice-versa. It is also possible during the winter there may be 2-hour delays and school cancellations. In the case of school cancellations at the remote site, the telepractice assistant notifies the supervisor, and the supervisor will notify the graduate student. If there is a closing at KSU, the supervisor will notify the remote site and the telepractice assistant. In the case of a 2-hour delay, the supervisor will notify the clinician only if the delay results in a cancellation of services.

Working Folders

Graduate students will maintain a working folder as they would in any other practicum experience at KSU. Students will be given the working folders by the clinical supervisor. Progress notes and session plans should be submitted to the supervisor in the working folder. The supervisor will return the edited plans to the students in their clinical mailboxes. Progress notes and session plans may not be submitted via electronic mail.

Goals and Objectives

Graduate students will be working with students who already have Individualized Education
Plans (IEPs). These documents have goals that describe the expected progress for the year and benchmarks that describe the steps that will indicate progress toward the goals. Students should work on the benchmarks stated in the IEP; however, with language goals, the graduate student should consider the benchmarks to be just that — indicators of progress, rather than exclusive goals in and of themselves. In consultation with the supervisor, the graduate student will select session goals and objectives. Graduate students should be prepared to collect data for every session; however, particular attention should be paid to gathering baseline information on benchmarks.

**Session Plans**

Session plan forms will be provided for the graduate students (form attached). Session plans, with accompanying data collection forms, will be submitted to the supervisor at an agreed upon time. Supervisors will review plans and return them to graduate students in a timely manner so that corrections can be made. The graduate student is responsible for making all changes within 24 hours of receiving the edited session plan from the clinical supervisor. Contact the clinical supervisor if you have any questions.

**Progress Notes**

In the school setting, clinicians keep data for each therapy session but typically do not write daily or weekly progress notes on the clients. Progress is reported to families and teachers when requested; however, progress is reported primarily in the Quarterly Progress Report.

For this clinical experience, however, graduate students will write therapy progress notes for each session. The clinical supervisor will provide a copy of the form and identify the time line for submitting those forms.

**Supervision/Feedback**

Students will be supervised 100% of the time and supervisors will provide written feedback (form attached). Please remember, the clinical supervisors are providing regular therapy services throughout the school day, so they may not be available right after the session to discuss your progress. You and your supervisor may decide at the start of this clinical placement to schedule your planning/feedback sessions.

**Grading**

Graduate students will be graded using the evaluation forms used in the KSU Speech and Hearing Clinic, however, additional items will be added that reflect the specific skills needed for telepractice.

**Structure of Sessions**

Sessions begin with a 1-minute review of the session goals (e.g., “today we’re working on the ‘f’ sound at the beginning of words”). Students should plan at least two activities for a 20-30 minute session. Intervention goals are reviewed at the end of the session.

**Telepractice Assistants**

One aspect of telepractice that is different from typical school-based or clinic-based services is the use of telepractice assistants. The telepractice assistants are paraprofessional personnel who ensure the technical aspects of telepractice run smoothly. Their responsibilities include operating and maintaining the equipment and documenting any technological problems, escorting the children to and from the room, on-site behavior management, distributing therapy materials (including fax pick-up), and giving out reinforcers. They are not speech-language assistants and do not perform any therapeutic activities.

Sometimes the children will ask for feedback or help from the telepractice assistant. The telepractice assistants are trained to direct the students back to the telepractice SLP or graduate student.

**Therapy Activities**

A unique aspect of telepractice is its reliance on software and web-based resources. However, “paper and pencil” activities may be utilized. Children find computer-based activities reinforcing, though some prefer “low-tech” activities (e.g., coloring, Battleship). Ultimately, the choice of therapy activity depends on the therapeutic goal.
Remote Site Materials
Each site has been provided a box with the following materials:
• 1 box of 24 crayons
• 1 glue stick
• 2 number 2 pencils with erasers
• 1 game die
• 1 pad coloring paper
• 1 pair scissors
• 3 cans of Play-dough
• Assorted stickers
• Manila folder with game board
• Envelope with approximately 50 tokens and 2 game pieces for game board
• 4 plastic sheet protectors
• 1 dry erase board
• 2 dry erase markers
• Construction paper – assorted colors
Additional materials, such as worksheets, may be faxed. The telepractice assistants have email accounts and may be able to access items scanned into PDF files. If you are going to fax something (e.g., an articulation Bingo game), it should be done least 1 hour prior to the session so that the telepractice assistant can pick it up.

Software-Based Activities
Microsoft Office Live Meeting allows for data sharing, meaning that clients can take control of an activity from a remote site. It should be noted that if there is sound associated with the program, it will not be heard by the remote site. This is true for Internet-based activities as well. Also, some Internet-based activities may not run well during the video conferencing session because of their size. Experiment with the intended websites and activities prior to the session and have a backup activity prepared. There is limited therapeutic software available in the clinic. Board games that can be used as reinforcement, such as Candyland, may be uploaded onto the clinician’s laptop and the client can take a turn from the remote site. There are several story-writing programs (e.g., Storyweaver or Books by You) that can be used.

Whiteboard Activities
Microsoft Office Live Meeting has a Whiteboard function that has data sharing. While text can be typed onto the Whiteboard, clinicians use it primarily for instruction (e.g., spelling); most clients do not have the keyboarding skills to type quickly enough. The Whiteboard may also be used for worksheets, graphic organizers, coloring pages, etc. by cutting and pasting.

Internet Activities
Many instructional and reinforcing activities are available on the Internet. The data-sharing function allows the child to participate from a remote site. There is a resource guide available with a number of useful sites.

At times Internet activities may fail to run properly during an intervention session. Graduate students should always plan a non-Internet-based activity as a back-up.

If an Internet site is to be used, the graduate student must provide the address to the supervisor on the Session Plan for prior approval.

Telepractice Equipment Operation Procedures
Initial Preparation
1. Turn on computer
2. Make sure Internet access is working properly
3. Log onto Microsoft Office Live Meeting website and schedule a meeting with your school district (if applicable)
4. Be sure to invite the district as a “presenter” (if applicable)
5. Send the email invitation to the meeting via Microsoft Office Live Meeting (if applicable)
6. Join the meeting as a “presenter” (if applicable)
Microsoft Office Live Meeting Operation

1. When the Microsoft Office Live Meeting window opens, you will need to turn your video and audio on. Use the dropdown menus to turn both audio and video on.

2. Wait for the district to log on and join the meeting.

3. You can share a document, website, or the white board by using the “Content” button. Simply select the Content button and then select “Share.” Highlight your application and then click. You may want to have documents and websites up and minimized to speed this process.

4. Use the top menu bar to give control to the students, end data sharing, etc.

5. When the session is ended, you can end data sharing and return to the main Office Live Meeting window to await the next group of students.

Troubleshooting

Your clinical supervisor is a direct service provider. She will demonstrate basic troubleshooting strategies and assist you with learning to use these strategies.
Appendix C

Kent State University Department of Speech Pathology and Audiology

Telepractice in Speech-Language Pathology Graduate Student Fact Sheet

Definition of Telepractice

Telepractice has been defined as “the application of telecommunications technology at a distance by linking clinician to client, or clinician to clinician for assessment, intervention, and/or consultation” (ASHA, 2004). Telepractice includes, but is not limited to, diagnostic, therapeutic, and case management activities (ASHA, 2004).

Project History

In 2006, the Ohio Department of Education convened a working group consisting of representatives from state professional organizations, state universities, the speech-language pathology and educational audiology supervisory network, the Ohio Board of Speech-Language Pathology and Audiology, and various staff. The working group developed a multi-faceted plan to reduce the shortage of SLPs in Ohio’s public schools that included a pilot project to provide school-based services via telepractice. The School of Speech Pathology and Audiology at KSU agreed to serve as the telepractice site.

Graduate Clinician Requirements

And Responsibilities

- Previous completion of SPA 64308 with a grade of B or better.
- You must be familiar with basic computer technology, hardware, and software.
- Demonstrate understanding of developmentally appropriate activities to foster growth in the speech-language domain by:
  a. designing appropriate interaction activities.
  b. collaborating with classroom teachers and other professionals in monitoring carryover in other school settings.
- Clinical Objective: To provide speech-language services via teleconferencing to school-age children in rural Ohio.
  a. You will provide speech-language intervention services to school-age clients via face-to-face, real-time teleconferencing.
  b. Clients typically have articulation, phonological, or developmental language disorders, but may include individuals with cognitive impairment, fluency disorders, or communication impairments as a result of autism.
  c. Sessions are generally one-on-one but may include groups of children.
  d. Consultative services and meetings are conducted via videoconferencing, electronic mail, and phone conferencing.
- Intervention Responsibilities
  a. Provide direct speech-language intervention as dictated by student’s IEP
  b. Provide consultative and collaborative intervention services as dictated by student’s IEP
  c. Collect and record data on student progress
  d. Complete and disseminate quarterly progress reports
  e. Prepare homework assignments for dissemination by telepractice assistant
  f. May assist in reevaluations as part of the multifactor evaluation process
  g. May assist in the development of speech-language goals on student’s IEP
- Other duties and responsibilities
  Maintains a consistent pattern of positive work habits and personal traits:
  a. Adhering to time schedules as developed for each site, including beginning and ending times.
  b. Establishing a positive rapport with families, children, colleagues, and building staff.
  c. Ensuring strict confidentiality regarding matters involving children, families, and staff.
  d. Demonstrating initiative through proactive approaches to dealing with situational language opportunities and interpersonal relationships.
  e. Displaying adaptability, dependability, and loyalty.
  f. Maintaining professionalism in appearance and public relations activities.
CEU Questions for Grogan-Johnson
Teaching New Dogs New Tricks: Training Speech-Language Pathology Graduate Students in Telepractice Service Delivery

1. ASHA advocates the use of telepractice for:
   a. SLPs
   b. Audiologists
   c. A variety of clinical settings
   d. All of the above

2. Which of the following is an advantage of the clinical training program in telepractice service delivery?
   a. Helps graduate students integrate technology into therapy sessions
   b. Helps graduate students learn visual and verbal cueing techniques
   c. Helps graduate students discover available internet resources
   d. All of the above

3. Which of the following is a skill identified by ASHA as important for providing telepractice services that is also important in a traditional service delivery model?
   a. Understanding cultural/linguistic variables impacting a client’s performance
   b. Understanding social media technologies
   c. Understanding various telepractice options
   d. All of the above

4. Training graduate students to provide therapy services by telepractice is widely available in speech-language pathology training programs throughout the United States.
   a. This statement is true
   b. This statement is false
   c. Training graduate students in telepractice is not approved by ASHA
   d. Training graduate students in telepractice is currently only occurring in Ohio
Abstract

Telepractice is becoming an accepted means for delivering services to a variety of populations. This is especially true for underserved populations, such as adolescents and adults who stutter. Recent research suggests that telepractice is a viable delivery option for people who stutter. It is understood in the stuttering research literature that intensive therapy programs with maintenance therapies are the most effective means of providing therapy to adolescents and adults who stutter. This paper describes efforts to develop the Intensive Stuttering Clinic for Adolescents and Adults, a therapy program that combines intensive therapy with a maintenance program offered via telepractice.

Keywords: telepractice, stuttering, intensive therapy, maintenance program, speech-language pathology

Learning Objectives

1. Identify the potential difficulties that adolescents and adults who stutter may experience.

2. Identify the benefits of intensive therapy and telepractice in providing services for people who stutter.

3. Describe the components of the ISCAA, a therapy program for adolescents and adults who stutter.

There is ample evidence that persons who continue to stutter into adolescence and adulthood are affected by their condition in many ways. Research has consistently found that people who stutter (PWS) of all ages are viewed in a negative stereotypical manner by a variety of professional and lay populations (Evans, Healey, Kawai, & Rowland, 2008; Hughes, Gabel, Irani, & Schlagheck, 2010). These stereotypes can have an impact on social relationships. For example, there is a significant body of research suggesting that children and adolescents who stutter are at increased risk for bullying from peers (Blood & Blood, 2004; Blood, Boyle, Blood, & Nalesnik, 2010). Furthermore, there is some evidence that stuttering impacts perceived attractiveness (Van Borsel, Brepoels, & Coene, 2011).

Though stuttering is not generally believed to be secondary to or caused by psychological or emotional disturbance, individuals who continue to stutter into adulthood often experience difficulties with emotional adjustment (Craig & Tran, 2006). For decades, research has suggested that PWS experience higher levels of anxiety and stress related to speaking and social experiences (Craig & Tran, 2006; Ezrati-Vinacour & Levin, 2004). Tran, Blumgart, and Craig (2011) found that individuals who stutter were more likely to report elevated levels of distress and negative moods than people who do not stutter. In addition, some research has found that PWS have an elevated risk of social phobia (Stein, Baird, & Walker, 1996). Finally, there is some research that has found that PWS are more prone to developing mental health and personality disorders than people who do not stutter (Iverach, et al., 2009). Stuttering has been found to impact the social, educational, vocational, and emotional aspects of a person's life, as well as to negatively impact quality of life (Blumgart, Tran, & Craig, 2010; Craig, Blumgart, & Tran, 2009; Cummins, 2010; Yaruss, 2010). There is ample evidence from this body of research that stuttering may lead to difficulties related to emotional and psychological adjustment.

Now, more than ever, it is imperative that there be accessible and appropriate stuttering therapy for adolescents and adults who stutter. Appropriate
therapy for many PWS is difficult to access for several reasons. Many speech-language pathologists (SLPs) report being uncomfortable or ill prepared to work with PWS (Brisk, Healey, & Hux, 1997; St. Louis & Durrenberger, 1993). This lack of comfort and preparation may be due to a continuing reduction in educational and clinical experiences related to stuttering (Yaruss & Quesal, 2002). Moreover, there continues to be a scarcity of SLPs who specialize in treating individuals who stutter (Manning, 2009). These issues, along with the difficult nature of stuttering and the length of therapy, make identifying appropriate treatment very difficult.

Research has found that one way to provide effective treatment to adolescents and adults who stutter is through intensive therapy programs (Boberg & Kully, 1994; Gabel, Daniels, & Hughes, 2008; Gabel, Irani, Palasik, Swartz, & Hughes, 2010; O’Brian, Packman, & Onslow, 2008). Intensive therapy allows individuals to live for several weeks in close proximity to a clinic that usually employs specialists in stuttering. While attending the program, individuals generally work on stuttering therapy for several hours a day. Thus, there is an “immersion” into stuttering treatment, often for between 60 to 75 hours (Gabel et al., 2010). This type of treatment allows individuals to have a very positive therapy experience that is unavailable in the city or area in which they live.

Though research demonstrates that intensive therapy is effective, some research suggests that follow-up, maintenance therapy may be needed to help individuals maintain therapy success (Gabel et al., 2010; Irani, Gabel, Daniels, & Hughes, in submission; St. Louis & Westbrook, 1987). One of the issues with offering follow-up therapy is that participants often travel a great distance to attend the intensive portion of the program but are unable to attend follow-up therapy. Several authors have offered alternatives, such as a traditional model of weekly follow-ups, shorter intensive follow-up sessions (e.g., two day refresher courses), and yearly intensive therapy (Blomgren, Roy, Callister, & Merrill, 2005; Boberg & Kully, 1994; Gabel et al., 2010; Irani, et al., in submission; St. Louis & Westbrook, 1987).

The History and Development of the Intensive Clinic + Telepractice Model

To address the shortage of therapy services for people who stutter, the authors have developed the Intensive Stuttering Clinic for Adolescents and Adults (ISCAA). The clinic was first developed at Bowling Green State University and continues to be developed at Texas State University-San Marcos and the University of Toledo. Initial studies have found that this therapy can have positive outcomes and that participants can maintain changes over several years (Gabel et al., 2008; Gabel et al., 2010; Irani, et al., in submission).

Treatment Procedures

The clinic employs a multifaceted therapy program that includes speech restructuring (i.e., fluency shaping), stuttering modification, and counseling (i.e., self-help) approaches. The program was initially developed based on therapy models described by several authors (Gregory, 2003; Guitar, 2006). The therapy program is delivered in three phases. Phase I of the program is generally initiated on the first day of therapy. During this phase, the clients are engaged in a process of increasing their awareness and understanding of stuttering. During both individual and group sessions, the clinicians guide the clients in identifying the behaviors that make up their stuttering problem: types of disfluencies, secondary physical reactions and tension, negative emotional reactions, and negative communication attitudes (Van Riper, 1982).

Phase II of the program is initiated during the first three to four days of therapy. Clients learn ways by which they might reduce the tension in their speech and stuttering. Open and honest stuttering and pseudo stuttering are utilized to assist clients in learning new ways to stutter without tension.
(Van Riper, 1982). In the later stages of Phase II, which generally span the entire program, the clients practice modification skills, such as pull-outs and cancellations (Van Riper, 1982). Phase III of treatment begins early in the second week of therapy. The focus of this phase of the program, which continues until the end of therapy, is to assist the clients in learning fluency enhancing techniques. Specifically, clients learn behaviors such as easy onsets, deliberate phonation, airflow management, and reduced rate. Initially, the clients learn to use each technique in the clinic at a very slow speech rate before progressing to generalizing these new behaviors at increasing speech rates, and then finally at more normal speech rates in extra-clinical settings.

**ISCAA Treatment Outcomes**

As mentioned earlier, studies have supported the benefits of participation in the ISCAA (Gabel, et al., 2008; Gabel, et al., 2010; Irani et al., in press). These studies have utilized a mixed-methods design and a combination of quantitative and qualitative data to study treatment outcomes. Quantitative data has included standardized clinical measures. The qualitative portion has included thematic analyses of interviews conducted with each client regarding his or her experiences with therapy, as well as his or her perceptions of the benefits of the program. Combining these methods has allowed for a broader understanding of the benefits of treatment. These three early studies were limited in that there was no control for the type of follow-up therapy provided for the participants.

**Need for Regular Follow-up**

Throughout the ISCAA, the clients are engaged in discussions that direct them to develop an individual maintenance program, which often includes a suggestion for follow-up therapy. As other intensive programs have found, we have identified that it is difficult to offer consistent maintenance programs (Gabel, et al., 2008; Gabel, et al., 2010; Irani et al., in press). In the past, we have offered clients a variety of options for follow-up therapy. Some clients, specifically those who lived in close proximity to the clinic, attended weekly or bi-weekly sessions in our clinic. Unfortunately, this option was not practical because most participants live a great distance from the clinic. Other clients attend 10-hour intensive follow-up sessions offered three times a year. This alternative was not practical because few clients were able to attend. The 10-hour model was not found to be beneficial to the clients.

**Efficacy of Telespeech Services**

Telepractice, also known as telespeech, is a means to deliver speech and language therapy to underserved populations that has been gaining acceptance (ASHA, 2005; Forducey, 2006; Juenger, 2009). There is a growing database of research studies exploring the efficacy of telespeech services. Two studies reported that the Lidcombe Program for Early Stuttering Intervention can be successfully delivered using telespeech, but additional treatment time might be needed compared to the clinic based program (Lewis, Packman, Onslow, Simpson, & Jones, 2008; Wilson, Onslow, & Lincoln, 2004). In a study of adults who stutter, O’Brian et al. (2008) found that a prolonged speech program could be delivered successfully using telespeech. In a study of school age children who stutter, Sicotte, Lehoux, Fortier-Blanc, and Leblanc (2003) found that six children improved and maintained their fluency using a therapy program delivered via telespeech. Thus, delivering therapy via telepractice appears to be a viable option for people who stutter.

**ISCAA and Telepractice**

To deal with issues related to follow-up, the authors of this article began to explore the use of telepractice to deliver services. In 2007, the first author began offering telepractice services to clients via weekly phone sessions to guide their follow-up therapy. The use of the phone to offer telepractice was relatively primitive and had some limited success. Despite its limitations, this early
exploration of telepractice allowed us to begin exploring the concept of expanding the clinics to include telepractice to deliver the maintenance portion of the program.

In 2008, we began to offer telepractice services as an adjunct to the ISCAA. Initially, we utilized free software and web cameras to offer telepractice. Primarily, we used Logitech web cameras and SKYPE or ooVoo. Though primarily person-to-person, this software did not meet HIPPA compliance, which led us to explore using other software that met HIPPA compliance. In subsequent years, we have utilized the web conferencing software Webex (Cisco Systems, http://www.webex.com). This system meets HIPPA compliance and allowed us to audio- and videotape interviews online in real time to review later for transcription purposes. To use the recording option, we had a Business Association Agreement with CISCO, but were careful to remove video samples of clients from the secure server and store these samples on a password protected local computer. This assured that the samples were secure and protected the clients’ confidentiality. Sustaining an audio signal was difficult, but we were able to correct for the inconsistent signal by using the phone for audio conferencing. We also identified that there are many teleconference products for personal computers, phones, or other devices.

We have conducted some initial pilot studies related to the use of telepractice as an adjunct to the ISCAA. One study by Irani and Gabel (2011a) found that combined intensive stuttering therapy with a follow-up program delivered via telespeech was effective for one adult who stuttered. The client was seen initially for the 15-day ISCAA then for a structured follow-up telepractice program. The program included therapy two times a week for six months via telepractice, then for one time a week for an additional six months. The participant in this study maintained reduced frequency and severity of stuttering during the follow-up program. Changes in communication attitudes and the reported impact of stuttering were positive, but not as dramatic as changes in fluency and stuttering severity.

In response to the problem that attending the ISCAA is inaccessible to many individuals, we utilized a shortened intensive program with telepractice in a 2009 pilot program. Each year between 15 and 20 individuals inquire and request applications for the ISCAA. Fewer than half of these individuals have been able to attend each year. Potential participants cited difficulties related to the financial burden of relocating to attend the program as well as problems pertaining to taking time away from work and school to attend the three-week program. Other intensive programs report similar difficulties and have suggested avenues for reducing the length of these programs without compromising the therapy (O’Brien et al., 2008). In this vein, we piloted a nine-day program of 75 hours of therapy on campus. We included all of the approaches and goals of the earlier three-week program. In essence, the shorter period reduced the financial costs (i.e., room and board) related to attending the program and allowed clients to take less time away from work and other activities. Fifteen clients completed the final 10-15 hours of therapy via telepractice. Several clients continued therapy for 6 months following therapy, some via telepractice and others in the university clinic.

We conducted a pilot study with a single case exploring the benefits of the 9-day version of the ISCAA followed by 10 hours of maintenance and then a telepractice follow-up program for six months (Irani & Gabel, 2011b). This client showed reductions in stuttering frequency and stuttering severity following the intensive portion of the program and maintained these changes at a six-month follow-up. The participant improved communication attitudes and experienced reduced impact of stuttering following the intensive sessions and telepractice follow-up.
Future Directions

The effectiveness of this early work has encouraged the authors to continue this program. The current model is to offer 60 hours of intensive treatment combined with telepractice follow-up therapy at the University of Toledo and at Texas State University-San Marcos. Research is underway to explore the immediate benefits of the intensive portion, the benefits and feasibility of offering telepractice, and long-term benefits of the programs for clients.

In general, we have found that offering the intensive clinic and then utilizing telepractice to offer follow-up therapy is a good model of treatment for several major reasons. First, as suggested in the literature, follow-up or maintenance therapy after an intensive program is critical for treatment success. Since many clients often travel great distances to attend these programs and do not have a local clinician who is an expert in stuttering treatment, the use of telepractice allows us to continue to help our clients. Secondly, the availability and ease of the teleconferencing software and hardware makes delivering therapy quite simple. Finally, we personally like the idea of working with our clients intensively first in order to establish rapport and teach necessary skills.

The second author has had some early success offering telepractice to clients using smart phones, tablet PCs, and other portable devices. Use of portable devices could be an important avenue for continuing to expand services. Portability allows therapy to occur in more naturalistic settings and clients might fit therapy sessions into their daily schedules quite easily. One avenue for future research might be to offer the entire ISCAA intensive and follow-up therapy phases via telepractice. This would greatly reduce clients’ costs related to room and board and travel and may increase the accessibility of services for many more people. It is important to consider that rapport would have to be established carefully and creativity would have to be incorporated to simulate “real-life” activities.

Group therapy is a key component of the intensive portion of the clinic but might not always be possible via telepractice sessions. Because of these concerns, it would be imperative to preserve these ideals to maintain the integrity of the program. Many teleconferencing software packages allow for groups of individuals to be involved in one session or meeting. It is conceivable that the entire ISCAA might be offered via telepractice. Telepractice might be a means to offer programs to children in schools. The first author has been involved in school telepractice programs for children with a variety of communication disorders (Gabel, Grogan-Johnson, Alvares, Bechstein, & Taylor, in submission; Grogan-Johnson, Alvares, Rowan, & Creaghead, 2010; Grogan-Johnson, Gabel, Taylor, Rowan, Alvares, & Shenker, 2011). One model is for children who stutter to be seen via telepractice by a specialist in stuttering during their school day, because therapy would be relatively easy to schedule and integrate into their school day. During the ISCAA at the University of Toledo, the first author plans to work with adolescents and their families to incorporate school SLPs and school into follow-up therapy. Telepractice will make this viable, and since most school systems already have adequate technology for using teleconferencing, this type of “partnership” may be managed relatively easily.

Limitations

Certainly, there are limitations to using telepractice. We found that the telepractice clinician was not able to work with the client in “real world” settings, such as talking with strangers, or to include naturalistic settings and activities outside of the therapy setting. These are important parts of the intensive programs and are often incorporated into our traditional, face-to-face therapy. The inability to work in naturalistic settings is a challenge, but creativity helps with this issue. For example, clients can complete phone calls in their settings while the clinician observes and interacts with
the client using teleconferencing. The client can complete home practice independently and the clinician can use the telepractice sessions to consult with the client on how to practice specific skills and techniques. Further, many clients can now access most software used for telepractice, (e.g., GoToMeeting, Cisco Webex, and Adobe Connect) from a smart phone, tablet PC, or other similar device at a variety of locations that offer free Internet connections (for example, at coffee shops). Careful consideration of confidentiality is a must when providing therapy in natural settings and should be considered when teleconferencing in public settings.

Another limitation is that teleconferencing software may not work correctly. There may be incompatibility between the software and the computer utilized by the client. In the same way, computer use may be a concern if the needed bandwidth is not accessible to the client. Thus far, we have been able to adjust the software to overcome these difficulties for most clients. Obviously, clients who do not have access to a computer at home or at a public site are unable to participate in telepractice. Some clients might be able to afford a smart phone or tablet PC that allows two-way video conferencing.

Caution should be considered when using telepractice. To our knowledge, there is little offered in most university graduate programs to prepare students for using telepractice. Though there are no specific guidelines for delivering telepractice, ASHA does offer suggestions regarding competencies and ethical issues (ASHA, 2005). In our development of this program, we have adhered to these competencies and to the highest ethical standards. It is notable that we have included students in our clinical program, assuring that our students receive more than the minimal training in stuttering and telepractice. Future research on our program and other programs should address issues related to training students and clinicians to deliver services via telepractice.

**Conclusions**

It is clear that telepractice is a viable option for follow-up therapy. We believe that the use of telepractice is especially important in treating stuttering, as there is such a small number of SLPs who specialize in stuttering treatment. The research supporting telepractice as a follow-up to intensive therapy and as a primary means of treatment is growing. We believe that there will be an increasing number of programs and therapists who will begin using telepractice to expand services to individuals who stutter.
References


CEU Questions for Gabel and Irani
Improving Services for People who Stutter: Intensive Therapy and Telepractice

1. The authors describe that adolescents and adults who stutter may have issues in all but one of the following aspects of life:
   a. General health
   b. Speech fluency
   c. Emotional health
   d. Social anxiety

2. The use of telepractice has been explored with the following populations of people who stutter:
   a. Only adults
   b. Only adults and adolescents
   c. Adolescents, adults, and children
   d. Only children

3. The ISCAA includes this amount of intensive, therapy services (in hours):
   a. 20 hours
   b. 60-75 hours
   c. 10 hours
   d. 2 hours a week

4. The authors identify one difficulty with telepractice services, which is:
   a. Affordability of software
   b. Difficult nature of the software
   c. Inability to work in “real-life” settings
   d. Having to use the phone for telepractice
Fostering Connections through Social Media: Strategies for Speech-Language Pathologists and Audiologists

Abstract

Social media and online social networks are having a transformational effect on how information is accessed and shared. Increasingly, individuals are turning to online social networks to seek information about everything from the mundane to the serious. Professionals from a range of disciplines, including medicine and allied health, are recognizing the value of using social media to foster deeper engagement and improved outcomes for the patients and clients they serve. For speech-language pathologists and audiologists, leveraging social media is no longer a choice; it is a necessity. With careful planning, speech-language and hearing professionals can use an array of social media tools to support improved outcomes for the individuals on their caseloads.

Keywords: social media, social network, online, speech-language pathology, audiology

Learning Objectives

1. Learners will be able to state how social media and online social networks are transforming how information is accessed and shared.
2. Learners will be able to describe how professionals can enhance their practice by using social media and online social networks.
3. Learners will be able to describe benefits to consumers when speech-language pathologists and audiologists use social media and online social networks.

Through the use of the Internet, social media, and online social networks, the ability to share information and connect with others is having a transformational effect on how people interact with each other. Not long ago, online “connecting” may have been dismissed as a pastime or simply a fad that attracted persons trying to find the latest bargain or seeking the perfect mate. Today, nothing could be further from the truth. Consider, for example, that one-third of Americans who go online to research their health currently use social networks to find fellow patients and discuss their conditions, and 36% of social network users evaluate and leverage other consumers’ knowledge before making health care decisions (Keckley, 2010).

For speech-language pathologists and audiologists who are attempting to expand their reach and client base, online social engagement is no longer a choice, but a necessity.

While most speech-language pathologists and audiologists would likely depend on traditional means such as a static website, phone calls, or email to reach potential patients and other stakeholders, these methods are proving to be time-consuming and inefficient. Increasingly, the general public, colleagues, physicians, state agencies, and other service providers are turning to digital and social media and online social networking to establish direct ways of connecting, communicating, and collaborating. Simply relaying information is no longer adequate; basic information should be provided as a starting point that facilitates deeper engagement and prolonged interaction. Moving forward, it will be imperative for speech-language pathologists and audiologists to establish a digital presence for their respective practices or programs. As Howard Luks, MD, (2011) states, “At its heart, digital media is about people; it is about relationships; it is about communication. A social media presence is about educating, engaging and growing your audience, improving outcomes, and compliance.”
Defining Digital and Social Media

Often, the terms digital media and social media are used interchangeably. However, purists would argue that the term “digital” refers to the medium in which information is conveyed (i.e., Internet, online). Social media represents those channels or outlets that will allow users to make connections. Defining it more specifically, Kaplan and Haenlein (2010) refer to social media as the use of web-based and mobile technologies (e.g., smart phones, tablet computers) to turn communication into an interactive dialogue that allows for the creation and exchange of user-generated content. To clarify the various forms of social media, the researchers also developed a classification scheme to describe each: collaborative projects (e.g., Wikipedia), blogs and microblogs (e.g., WordPress, Twitter, Tumblr), content communities (e.g., YouTube, Vimeo, Flickr), social networking sites (e.g., Facebook, LinkedIn, Google+), virtual game worlds (e.g., World of Warcraft), and virtual social worlds (e.g., Second Life) (Kaplan & Haenlein, 2010). Therefore, a well-defined online social presence would incorporate several of these instruments.

Who Is Using Social Media?

Madden and Zickuhr (2011) recently found that two-thirds of adult Internet users (65%) use a social networking site like Facebook or LinkedIn, which is double the percentage of users (29%) reported in a similar survey in 2008. More importantly, these results also reflect a startling new data point: half of all adults (50%) use social networking sites. In the past six years, the growth of social networking sites has been meteoric; in contrast, just 8% of Internet users – or 5% - of all adults reported joining or being a member of these sites in 2005. By comparison, of the “daily” online activities that were surveyed, only email (which 61% of Internet users access on a typical day) and search engines (which 59% use on a typical day) are used more frequently than social networking tools.

According to Madden and Zickuhr (2011), among Internet users, social networking sites are most popular with women and young adults under the age of 30. Young women aged 18-29 are the most frequent users of social networking, with nearly 90% of those who are online accessing the sites. Of those young women who are online, 69% are visiting social networking sites on a daily basis. For men who are online, 60% are using social networking sites, and 38% visit those sites on a daily basis. Examining social networking more broadly, eight out of 10 Internet users ages 18-29 use social networking sites (83%), compared with seven out of 10 (70%) 30-49 year-olds, half of 50-64 year-olds (51%), and a third of those age 65 and older (33%). While young adults are the most frequent users of social networking sites, there has been a significant increase in the number of users over the age of 65 in the past two years (2009-2011), growing 150%. Similarly, during the same two-year period, users 50-64 years doubled – from 25% to 51%, making this one of the fastest growing age groups. And finally, there are no significant differences in use of social networking sites based on race and ethnicity, household income, education level, or whether the Internet user lives in an urban, suburban, or rural area. These results underscore the fact that Internet use and social networking are on the rise across all demographics.

Are Social Media and Social Networking Just Fads?

While some Internet companies that provide social networking opportunities or other web-based services may no longer be as popular (e.g., MySpace) or in business, even the casual observer can no longer ignore the explosion of social media and how it is shaping the ways people shop, socialize, and learn about the world around them. To highlight the scope and reach of social media, Bullas (2011) made several observations: 1) one in every nine people on Earth is on Facebook; with
more than 750 million users, it could be considered the third most populated country (i.e., if it had geographical constraints) in the world, just behind India; 2) users spend 700 billion minutes per month on Facebook, and each user spends on average of 15 hours and 33 minutes a month on the site; 3) more than 250 million people access Facebook through their mobile devices (e.g., smart phone, tablet computer), and more than 2.5 million websites have integrated with Facebook; 4) approximately 30 billion pieces of content are shared on Facebook each month, and 300,000 users help to translate the content into 70 languages; 5) YouTube, the video sharing site, has 490 million unique users who visit each month and generate 92 billion page views, equaling a total of 2.9 billion hours per month; 6) Wikipedia, the user supported encyclopedia, hosts 17 million articles and has 91,000 content contributors; 7) every minute, people upload 3,000 images to Flickr, the photo sharing website, and it now has more than five billion images on the site; 8) Twitter now handles nearly 200 million tweets per day and continues to add 500,000 users each day; 9) LinkedIn, a networking site focused on professionals, has more than 135 million users worldwide; and 10) Google+, a more recently launched social networking site, has more than 25 million users. Consequently, the use of social media continues to have a profound effect on nearly every aspect of American culture, and its impact is certainly not limited to the United States.

Social Media in Healthcare: A Shift in Communication

Through social media, individuals have the opportunity to connect with others who have shared experiences or similar interests. In healthcare, once a diagnosis is confirmed, most individuals may conduct a web search to gather additional information, visit the website of a noted medical facility or practitioner, or watch related videos that have been posted on a content sharing website. Increasingly, individuals are turning to their online social networks for information, support, and other resources when a health-related crisis emerges. According to a recent study (National Research Corporation [NRC], 2011), one in five Americans uses social media websites as a source of healthcare information. NRC surveyed nearly 23,000 consumers and found that 94% of respondents indicated that they had used Facebook to gather information about health-related issues. Some 32% of the respondents listed YouTube, and 18% had used Twitter.

Within the same study (NRC, 2011), researchers found that when asked about social media’s influence, 25% of respondents said it was “very likely” or “likely” to influence their healthcare decisions. Likewise, when asked about their level of trust in social media, 32% said “very high” or “high” and only 7.5% said “very low.” Half of the respondents (50%) preferred their hospital or medical provider’s websites as a primary source of online health information, but 14% preferred an integrated approach of websites and social media.

New research is starting to examine and demonstrate the influence social networks can have on an individual’s healthcare decisions. Centola (2011) designed a study involving 1,528 participants who had anonymous online profiles coupled with a series of health-related topics. The participants in the study were matched to groups of other “health buddies” who shared the same interests or diagnoses. Periodically, participants received email updates about the activities of their health buddies. The participants were placed into one of two distinct social networks, one with fewer overlapping interests or another that contained larger clusters of people with closer relationships. The groups were then asked to register online at a health forum website that sought ratings of consumer health resources. Centola (2011) found that 54% of the people within the clustered network (i.e., individuals with stronger ties with each other) registered for the health forum on the website, and the rate of
participation was four times faster. Only 15% of participants with one friend in the forum returned to it, but more than 30% of participants with two friends returned to it. Most importantly, 40% of participants with three friends made repeated visits to the online forum. Thus, peer-to-peer recommendations from a shared community or network provided more influence, and those recommendations were more successful at shaping behavior.

Opportunities for Speech-Language Pathologists & Audiologists

According to the Centers for Disease Control and Prevention (CDC) (2011, p. 1), “using social media tools has become an effective way to expand reach, foster engagement, and increase access to credible, science-based health messages.” For speech-language and hearing professionals, establishing and maintaining a social media presence is now a necessity. Practitioners must be willing to position their practice or program where, when, and how consumers wish to be engaged, typically through a variety of social media (e.g., Facebook, Twitter, YouTube). That is, when a patient or colleague wishes to interact, that individual should be able to find the practice or program through their preferred social media or network. A static, template-driven website is no longer adequate to meet the needs of today’s speech-language and hearing professionals and their stakeholders.

Trends indicate that more speech-language pathologists and audiologists are beginning to embrace social media. For example, the American Speech-Language-Hearing Association (ASHA) has a Facebook page where speech-language pathologists, audiologists, students, and researchers are able to post information related to speech, language, or hearing issues, view related videos with a link to YouTube, learn about upcoming events, and seek professional opportunities through a career center. ASHA has also launched ASHAsphere, an online blogging community, where users discuss a range of issues related to the fields of speech-language pathology and audiology. Similarly, speech-language and hearing professionals are using Twitter to instantly provide links to online content, search for information, and build social networks by “following” other individuals, organizations, or businesses to receive updates. As well, professionals have developed groups through other social networking sites such as LinkedIn. These groups are both profession-related (e.g., “Speech-Language-Hearing Professionals”), or they may be set up to support networking and collaboration around a specific interest, such as telemedicine/telepractice, early intervention, or spoken language acquisition in children with hearing loss (e.g., “6 Sound-Off”). These online connections may provide an initial introduction for prospective clients or they may foster ongoing communication that supplements more traditional communication or “in person” interactions.

Physicians are turning to social media and building online presences to engage with their patients. Modahl, Tompset, and Moorhead (2011) reported that 90% of physicians use at least one social media site for personal use and over 65% use the sites for professional purposes. Similarly, Haupt (2011) found that more than 1,300 doctors have registered with TwitterDoctor.net, a database of physicians who tweet (i.e., send messages of 140 characters or less through Twitter). Physicians are finding it easier to connect with patients outside their offices. Social media provides another channel to provide patients additional information about various diagnoses, treatment options, and medical procedures, as well as to answer questions that may be lingering since the patient’s last office or hospital visit. As Thomas Lee, MD, states, “It’s an electronic way of extending the conversation. It creates a vibrant sense of community and wonderful back-and-forth dialogue,” (Haupt, 2011).
For speech-language and hearing professionals who work primarily with children, evidence continues to show that parents are using the Internet, social networking sites, and social media to access information on a range of health-related topics, identify resources, participate in support groups, make family-to-family connections, and advocate for continued services (Khoo, Bolt, Babl, Jury, & Goldman, 2008; Knapp, Madden, Wang, Sloyer, & Shenkman, 2011; Plantin & Daneback, 2009; Porter & Edirippulige, 2007; Skinner & Schaffer, 2006; Trotter, 2008). More specifically, parents are seeking both information and support through their online engagement.

Social Media: Where to Start

As with most significant undertakings, establishing an efficient social media presence will require careful planning. Practitioners will need to evaluate their needs, examine available resources, and eventually craft a comprehensive social media strategy that can be incorporated into a larger practice or program communication plan. Ultimately, the social media strategy, by its nature, must be flexible and allow people to access information in different ways, when they wish to do so, and for varying purposes.

The CDC (2011) has developed comprehensive resources on how to organize and design a social media strategy, including a planning form that is adapted and summarized below. Speech-language pathologists and audiologists can use this outline to develop a social media strategy for their practice or program.

1. Identify Target Audience(s): Describe the stakeholders that the practice or program is attempting to reach. For example, those individuals could be parents and caregivers, extended family members such as grandparents, families who speak English as a second language, physicians (e.g., family practitioners, pediatricians, otolaryngologists), service providers (e.g., early interventionists, other speech-language pathologists and audiologists), family support organizations, state agencies, researchers, and university partners. As individual practitioners identify their local stakeholders, this list will vary.

2. Determine Your Objective: What does the practice or program want to achieve through social media? For example, does the practice or program wish to a) raise awareness about the availability of the services that are provided; b) develop new ways to share information to clients or patients; c) increase direct communication among service providers or collaborative partners; and d) connect clients or patients with other resources or community support services? This list is not exhaustive, but does represent the types of objectives that could be written. As objectives are finalized, use SMART (i.e., Specific, Measurable, Achievable, Realistic, Time-bound) objectives to maintain clarity of focus.

3. Define Audience Communication Needs: Stakeholders will access the practice or program through various social media outlets, at different times of the day or night, and for various purposes. Surveying the practice’s various stakeholders to determine their communication needs will aid in deciding how to proceed.

4. Goal Integration: Speech-language pathologists and audiologists should a) describe how the practice’s social media objectives support the organization’s mission and/or overall communication plan, and b) detail how the objectives support other online or offline components. For example, how does the social media outreach fit into the larger communication plan for the practice or program? How well is the social media plan integrated with existing online tools, such as the practice’s website or existing social media efforts? That is, some practices may have established specific social media tools, such as a Facebook page or a Twitter account. However, a social media plan was never developed, and those tools are no longer being fully utilized or even maintained.
5. **Message Development:** What are the key messages based on the target audiences and the identified objectives? These messages should speak directly to the target audience; be relatively short and to the point; and encourage a desired response or action. For example, to encourage parents of young children with hearing loss to keep hearing aids on their infant or toddler, a message could be: “A child is never too young to hear a parent’s voice.”

6. **Resources and Capacity:** The next step is to determine the program’s resources and its overall capacity to support a social media strategy. Practitioners will need to determine who will be responsible for implementation and how much time the individual(s) spends creating content, updating information or messaging, maintaining the various social media outlets/accounts, and providing general support to these efforts.

7. **Identify Social Media Tools:** Deciding which social media tools to employ should be based on the needs of the target audiences and the practice’s or program’s stakeholders. To establish a social media presence, a Facebook page may be the first place to start. Links to online resources, treatment protocols, evidence-based practices, guidelines, program policies, and videos of clients or patients discussing their experiences could be added. The page also would function as a place where patients could post questions to be answered by the speech-language or hearing professional. Once the Facebook page is established, the practice may wish to add other social media tools, such as a YouTube channel, to post informative videos about child development, language facilitation strategies, hearing technology, or other topics related to a specific population, disability, or disorder. A Twitter account could be used to deliver information to stakeholders quickly and to post links to other information online. As the needs of the practice and its stakeholders evolve, additional social media tools can be added to meet those objectives.

8. **Define Activities:** Once the social media tools have been selected, defining how they will be used will be critical. Following a management plan will ensure that all of the activities are carefully planned and coordinated. Consistent communication with the practice’s stakeholders will allow close monitoring of their communication needs, and the social media strategy will need to be flexible to address new or shifting demands. New technology and social media tools will emerge and continued adaptations will be required.

9. **Identify Your Key Partners and Their Roles and Responsibilities:** One of the biggest challenges of having and maintaining a social media presence is the generation of new, relevant content. Static content, which is typically stored on a website, is important as reference material. Stakeholders should always be directed back there as needed. However, what about a new information that should be shared? This should be sent quickly through email as well as posted on the Facebook page. Additionally, a practitioner should send a tweet with a link to the online policy, thus alerting all of the practice’s followers on Twitter about the posting. All of this should occur instantly or within a few minutes. However, to achieve this level of efficiency, the process must be finely tuned. Who will generate the content and then upload it to the website? Then, who will post it to the Facebook page and monitor the comments on the wall? Who will monitor the tweets that will be generated? To be successful, all of these activities must be carefully coordinated. In this example, the tweet cannot be sent until the content is written and posted. Establishing partnerships among key staff members or with external stakeholders to assist in the development of content, the posting of new information, and the monitoring of postings or comments will be critical to the practice’s overall success.
10. **Define Success for Evaluation**: For speech-language pathologists and audiologists, a successful social media presence will be reflected in the outcomes that have been developed. That is, if one objective is to use social media to improve communication with patients and increase compliance with follow-up appointments, then that is a measurable outcome. In this example, success will be defined based on the number of clients or patients seen in a timely manner. Hopefully, after the implementation of a coordinated social media plan, those numbers will increase. Therefore, for each objective that is established for social media outreach, indicating what success looks like will be essential.

11. **Evaluate**: As mentioned, the CDC (2011) has developed a comprehensive social media guide for health-care providers, which includes recommendations for social media evaluation. The suggested approach involves identifying the program’s inputs, outputs, and outcomes. For example, inputs could be the number of messages generated by staff or other content partners. Outputs are the products generated through social media. These could be the number of tweets sent and then retweeted. Outputs could be the number page views, friends obtained, or followers; they could be the number of posts to a Facebook page and then the number of subsequent “shares” or comments that are generated. Several online websites can assist with capturing and generating these analytics. Outcomes, as mentioned previously, are the long-term behaviors or changes that are most desired.

By carefully planning the social media strategy and measuring the outcomes, speech-language and hearing professionals will remain well positioned to meet the online needs of their stakeholders.

**Future Directions**

Engagement through social media and online social networks has become a necessity for speech-language pathologists and audiologists. The question is no longer whether to do it, but how can it be done well. Today, social media is allowing individuals to connect, communicate, and collaborate in exciting new ways. Many hospitals, healthcare providers, and related disciplines are utilizing social media strategies to connect with their patients and foster deeper engagement and improved outcomes. With careful planning, speech-language pathologists and audiologists can leverage an array of social media tools to expand service delivery and ensure improved results for the individuals currently on their caseloads.
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CEU Questions for Houston and DeMoss
Fostering Connections through Social Media: Strategies for Speech-Language Pathologists and Audiologists

1. ____________ is the use of web-based and mobile technologies to turn communication into an interactive dialogue that allows for the creation and exchange of user-generated content.
   a. Digital media
   b. Social media
   c. Social networks
   d. Blogging

2. Facebook is an example of a ____________.
   a. Microblog
   b. Virtual game world
   c. Collaborative project
   d. Social networking site

3. In a recent study of 23,000 consumers, ____________% of respondents had used Facebook to gather information about health-related issues.
   a. 94
   b. 70
   c. 53
   d. 26

4. While the use of social networking is increasing across age groups and demographics, one of the fastest growing age groups is comprised of individuals who are:
   a. 18 – 29 years old
   b. 30 – 49 years old
   c. 50 – 64 years old
   d. 12 – 20 years old
Abstract

Telehealth is gaining support nationally. Delivery models are synchronous, asynchronous, and hybrid (using synchronous and asynchronous combined). Improved software and hardware, such as high-resolution cameras, have made telehealth practical. Access to telehealth connectivity has become more affordable and available in rural networks. However, start-up costs, reimbursement for services, and state licensure issues continue to be barriers to telehealth. Despite these barriers, some clinicians are seeing audiology telehealth as a means to provide better hearing health services to rural communities. Applications to audiological evaluations, specifically for cochlear implants, pure tone audiometry, and otoacoustic emissions, are discussed in this article.

Keywords: telehealth, telemedicine, teleaudiology, audiology, internet

Learning Objectives

1. Learners will state three telepractice delivery models.
2. Learners will describe two forms of hardware needed for audiology telepractice.
3. Learners will describe three uses of telepractice in audiology.
4. Learners will describe one barrier to telepractice in audiology.

Telehealth services can be delivered by either synchronous or asynchronous models (Deshpande, Khoja, McKibbon, & Jadad, 2008). Synchronous delivery models use a telecommunications link that allows video, audio, and computer data to be transmitted in real-time. Videoconferencing equipment and software are common technologies used to provide synchronous telehealth services. In addition, peripheral devices such as video otoscopes, computerized audiology systems, or hearing aid programming units can be attached to a computer to create an audiology telehealth system (Deshpande et al., 2008; Krumm, Ribera, & Froelich, 2002; Lancaster, Krumm, Ribera, & Klich, 2008). Figure 1 shows how pure tone testing could be conducted using remote computing software (via the Internet or a Local Area Network [LAN -- equipment and software that supply networking capability to a group of computers in somewhat close proximity to each other, for example, in a hospital complex]), and “off the shelf” (OTS) computerized audiometric equipment. In the Figure 1 example, an audiologist at a regional clinic is providing hearing health care to a client at another location, with the aid of a facilitator.

Asynchronous telehealth models use a store-and-forward delivery system in which digital images (video, audio, and other forms of clinical data) are captured and “stored” on the computer at the patient test site. Then, at a later time, the information is transmitted securely (“forwarded”) to the specialist (Lancaster et al., 2008). The specialist reviews the information and then provides a diagnosis or other feedback to the patient or caregiver at the patient test site.

A third delivery system, called a hybrid model, uses both synchronous and asynchronous technology together to provide delivery of services. This system can be useful when more than one form of communication is necessary.
to provide appropriate services. For instance, a synchronous mode can be used to assess hearing thresholds and an asynchronous mode to provide tympanometry. The hybrid environment occurs when both synchronous and asynchronous modes are used together or overlap. Figure 2 offers a conceptual model how synchronous and asynchronous technologies may be utilized together to create a hybrid model.

While the computerization of audiology equipment has led to an increased interest in telehealth, only limited empirical data exist concerning the delivery of audiology services via telehealth. Consequently, audiology is perhaps one of the last medical professions to realize the benefits of telehealth for clinicians and their clients. However, in the past five years audiology telehealth research has become increasingly available, particularly in the areas of cochlear implants, pure tone audiometry, otoacoustic emissions, auditory brainstem response, pediatric applications, and self-screening of hearing acuity.

**Cochlear Implants**

Franck, Pengelly, and Zerfoss (2006) appear to be among the first researchers to publish the outcomes of telehealth procedures in conjunction with cochlear implants. Specifically, Franck et al. programmed patients’ cochlear implant devices at distant centers using computer networks and remote computing software (PC Anywhere software). These investigators indicated that telehealth procedures were successful with 10 subjects and with two different cochlear implant systems. They expected to continue cochlear implant services via telehealth technology with positive outcomes.

Telehealth services are used to provide cochlear implant programming services in Florida using remote control procedures (Polovoy, 2008). Similar services are being considered in at least two other states to support cochlear implant patients in rural areas.

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*Figure 1. Testing clients over the Internet or a LAN using OTS computerized systems*
Pure Tone Audiometry

Researchers have conducted a number of studies describing the use of synchronous telehealth technology to provide pure tone testing. Early reports were supplied by Givens and Elangovan (2003) and Givens et al., (2003), describing a study in which hearing tests were conducted using a portable digital audiometer interfaced to a network card. The pure tone audiometer was controlled by remote computing software that was precisely operated over a computer network. Results indicated that pure tone thresholds obtained side-by-side and by telehealth were essentially equal for 45 participants. Although the results of this study were encouraging, the telemedicine trials and the side-by-side trials conducted by Givens et al. both took place at the same site. Further validation with remote computing technology over greater distances would be important for validation.

Choi, Lee, Park, Oh, & Park (2007) developed an audiometer for telehealth applications. This system was capable of remote measurement of hearing. More research comparing side-by-side testing with remote testing is needed in order to validate this system more completely.

Finally, Krumm, Ribera, and Klich (2007) attempted to provide hearing testing using a web cam, remote computing software, and an OTS computerized audiometric system. The investigators tested 30 normal hearing participants 600 miles away and found no statistical difference for pure tone thresholds obtained via telehealth and side-by-side protocols. Results of this study suggested that remote computing services could be offered using OTS audiometric systems to provide hearing tests as an aspect of telemedicine. Additional research is needed using this paradigm as no hearing impaired persons participated.
Otoacoustic Emissions (OAE) and Auditory Brainstem Response (ABR)

Elangovan (2005) described a customized otoacoustic emissions system that was interfaced to a network card and operated by remote computing software. This system was operated by a software application similar in concept to the telehealth audiometer described by Givens et al. (2003). Elangovan found that the system yielded similar distortion product otoacoustic emissions (DPOAE) results for five persons tested side-by-side and remotely. Krumm et al. (2007) used an OTS computerized distortion product otoacoustic emissions (DPOAE) system, a web cam, and remote computing software to administer DPOAE testing to adults 500 miles away from the researchers. Like Elangovan (2005), Krumm et al. found their DPAOE data obtained by telehealth technology to be equivalent to data obtained side-by-side.

The ABR and OAE systems commonly utilized in infant assessment are generally operated through desktop personal computers (PCs) and many ABR and OAE systems can be employed for both synchronous and asynchronous telehealth applications. Krumm, Huffman, Dick, and Klich (2008) published data validating telehealth technology with infants. These researchers conducted DPOAE and ABR testing on infants who had not passed prior DPOAE screening at birth and were being seen for re-screening at their regional medical hospital. Using a computerized ABR and DPOAE systems, remote computing software, and a web cam, Krumm et al. administered tests to infants 150 miles away. Remote computing technology recorded DPOAEs and automated auditory brainstem response (AABR) data for 30 infants ranging in age from 11–45 days (average age 16 days). Results obtained via face-to-face and via telehealth were essentially equal. Few of the 30 infants exhibited hearing loss, so further validation with this paradigm appears warranted with infants with hearing loss. This study represents one of few examples of peer-reviewed articles concerning telehealth OAEs and ABR testing in pediatric populations. Krumm, Ribera, and Schmiedge (2005) discussed theoretical pediatric applications of telehealth and OAE testing, including rationale, models, and pilot data supporting the use of telehealth technology in infant hearing screening programs.

It should be recognized that trained assistants are needed at the local (client) site to apply OAE probes, earphones, and electrodes to infants when hearing testing is conducted via telehealth. Assistants must be trained to adjust malfunctioning or improperly fitting screening probes, electrodes, or earphones. Past audiology telehealth studies used an audiologist or graduate students at the participant test site (e.g., Eikelboom, Miao, Coates, Atlas, & Gallop, 2005; Givens et al., 2003; Krumm et al., 2007; Lancaster et al., 2008; Towers, Pisa, Froelich, & Krumm, 2005), not taking into account the abilities of paraprofessionals. An important consideration in telehealth services is determining who will provide patient preparation, equipment set up, and simple tests. Further investigation examining the use of trained assistants is necessary.

Telehealth and Pediatric Applications

In all likelihood, telehealth practices will be used increasingly by practitioners in Early Detection and Hearing Intervention (EDHI) programs. A National Center for Hearing Assessment and Management (NCHAM) survey (2010) reported that 42% of the states interviewed were pursuing some efforts to begin audiology telehealth for newborn hearing screening and follow-up services. Approximately 50% of their efforts are to provide diagnostic audiology or management for the birth to 4-year-old population. In recently funded programs, the U.S. government has encouraged EDHI programs to investigate and consider the use of audiology telehealth applications. This is not surprising, as EDHI program goals can be difficult to achieve due to the significant number of infants that are lost to follow up testing (Kochkin, Luxford, Northern, Mason, & Tharpe. 2007).

Self-Screening

One valuable asynchronous application is self-assessment of hearing sensitivity. Presently, self-assessment procedures using hearing testing online appear to suffer from questionable calibration, poor validation, and lack of control over environmental noise levels. However, phone-based hearing screening programs utilizing speech-in-noise stimuli, as described by Smits,
Kapteyn and Houtgast (2004), have been validated and overcome many of the calibration issues associated with pure tone testing over the phone.

**Accessibility of Telehealth Technology**

The greatest benefits of connectivity are related to accessibility. Even the most remote rural communities in the U. S. generally have broadband capacity through commercial satellite or cable Internet services. These services are developing an even greater presence in rural areas as costs drop and quality improves. Many states have intentionally created powerful Internet capacity at rural schools, government offices, colleges, and medical clinics to provide accessibility to current information and research. These infrastructure improvements provide a gateway for telehealth services to these facilities. Some rural communities have state-of-the-art telehealth suites with high quality interactive video equipment and exceptional bandwidth capabilities. Access to these facilities is often granted to clinicians by state or local telehealth administrators and a fee for use is commonly required. This fee provides greater quality and privacy and serves as a cost-efficient solution for providing “face-to-face” services to distant rural areas.

**Convergence of Technology**

In the past year, surprising hardware and software solutions have become practical due to dramatic changes in software capacity. Inexpensive web cameras marketed primarily to home users are coupled to cost-effective high quality interactive video software. Clinicians are now able to experience high-resolution interactive video conferencing with clients at a fraction of the cost required two or three years ago. Manufacturers have developed software that meets the needs of telehealth. For example, one manufacturer has provided an encryption program that is seamlessly embedded in interactive video to comply with the Health Insurance Portability and Accountability Act (HIPAA).

**Barriers to Telehealth**

One of the greatest barriers to audiology telehealth service delivery is cost start-up for equipment, technical support, and software purchases. Commercial audiometers capable of telehealth applications will cost approximately $5,500-$25,000, depending on the system purchased. A sound booth is required if diagnostic audiometry (rather than screening applications) are anticipated.

Sources for reimbursement for services must be identified early in the planning stages of audiology telehealth programs. Not all insurance companies will reimburse for telehealth services and do not uniformly compensate for store-and-forward services. Contracts with educational or government agencies may provide some reimbursement.

Licensure and liability issues need to be examined in the early stages of telehealth service planning. Practitioners will likely have to be licensed in all states to which they are providing telehealth services as well as in the state where they reside. Licensure boards for many states do not have policies regarding telehealth for audiology practice and specific assurances in these circumstances must be obtained before services are administered. Risk management must be assessed and proper insurance to cover telehealth activities must be secured. A significant component of any telehealth program is HIPAA-compliant procedures to ensure confidentiality of client information.

The cost and availability of equipment are concerns for clinicians who desire to use telehealth technology. In fact, telehealth equipment requires little increased cost; a web cam and headset can be purchased for under $100.00. The use of quality telehealth equipment does not always require great costs.

**Discussion**

In spite of the significant challenges, telehealth services could help alleviate the problem of providing high quality services to consumers living in rural and isolated communities. Infants who are not receiving follow up for newborn hearing screening could benefit from telehealth services provided closer to home. Elderly people living in long-term care facilities could receive timely services without leaving the care center. Those living in such situations are likely to benefit most from telehealth (Givens & Elangovan, 2003).
References


CEU Questions for Krumm and Lisonbee
Audiology Telehealth Services: A Review

1. Asynchronous delivery models use a delivery system in which digital images are:
   a. Stored-and-forwarded at a later time
   b. Acquired by computer and then sent via paper
   c. Transmitted in real-time
   d. Stored-and-forwarded and transmitted in real-time

2. Barriers to telehealth include:
   a. Governmental regulations
   b. Start-up cost, reimbursement, and licensure issues
   c. Support from ASHA and AAA
   d. Lack of need for telehealth services in rural areas

3. A study by Elangovan (2005) used:
   a. Otoscopy and tympanometry through synchronous telehealth technology
   b. Synchronous telehealth to remotely conduct a hearing test using a desktop computer and an Internet connection
   c. Provided school hearing screenings through asynchronous telehealth technology
   d. A customized otoacoustic emissions system that was interfaced to a network card and operated by remote computing software

4. Audiology is one of the last medical professions to realize the benefits of telehealth for clinicians and their clients because:
   a. The lack of computerization of audiology equipment
   b. Audiologists are disinterested in telehealth options
   c. Limited empirical data exist concerning the delivery of audiology services via telehealth
   d. There has been no need for telehealth options in the field of audiology

5. An example of telehealth that is currently being used by audiologists in Florida is:
   a. Cochlear implant programming
   b. Full audiological evaluations
   c. Newborn hearing screenings
   d. Auditory brainstem evoked response
It is my pleasure to serve as guest editor for *eHearsay* 2013. I am especially excited because the issue theme will be devoted to fluency and fluency disorders. Working with people who stutter has been the focus of my career and I am glad to contribute to *eHearsay*. I believe it is important to share information about stuttering, an area where many clinicians report being uncomfortable, with the readers of *eHearsay*. I hope we can develop a meaningful publication that allows clinicians to gain some important information about this often misunderstood communication disorder.

We are soliciting articles on the nature, assessment, and treatment of fluency disorders, on student clinical training programs that address fluency, and on any other topics related to this theme. As is *eHearsay*'s custom, we invite off-theme submissions on any other topics that would be of interest to our readers. *eHearsay*'s columns include Research Forum, Clinic Forum, University Forum, School Forum, Clinical Grand Rounds, Pragmatically Speaking (advice and practical matters), Getting Down to Business, Hearing is Believing, and Speakeasy (essays, views, commentaries, and opinion pieces).

Papers or articles must be submitted by December 1, 2012 to Rodney.Gabel@utoledo.edu in order to be considered for publication in the summer of 2013. Please contact me or the *eHearsay* editor, Laurie Sheehy, at Laurie.Sheehy@utoledo.edu, if you have any questions or you would like to receive an author information packet.

With regards,

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The Department of Rehabilitation Sciences, SLP Program
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Open Call For Peer Reviewers For *eHearsay*, The Electronic Journal of The Ohio Speech-Language-Hearing Association

*eHearsay*, OSLHA’s electronic journal, addresses the professional development needs of OSLHA members. Themed issues are published on the OSLHA website each June, with off-theme articles sometimes included. *eHearsay* publishes research articles, case reports, commentaries, tutorials, essays, reviews, and other professional content. ASHA CEUs are available for some articles.

*eHearsay* is seeking manuscript reviewers. Preferred qualifications include a record of professional publication and a defined area (or areas) of expertise in speech-language pathology and/or audiology. Reviewers will be sent manuscripts on an as needed basis throughout the year. Guidelines for reviewers and review forms will be provided at the time of each review. Reviewers should be able to judge an article’s significance, timeliness, relevance, research base, methodological soundness, and clarity. Reviewers need not edit papers for form and style. Most reviews will be double blind.

Interested applicants should send an email describing area(s) of expertise. Please attach a CV or resume listing relevant professional publications and employment history. Doctoral candidates are encouraged to apply. Inquire or apply to Laurie Sheehy, *eHearsay* Editor, Laurie.Sheehy@utoledo.edu.

*eHearsay* welcomes reviewer applications on an ongoing basis. There is no deadline to apply. Please forward this email to any of your colleagues who may be interested.