

Introduction to the 2018 Conference Papers
Linda I. Shuster, 2019 ANCDs President

When I assumed the role of ANCDs President, I described the focus for my presidency, which is on promoting the implementation of research into clinical practice. The conference papers that follow are one effort that I have undertaken aimed at bridging the gap between research and practice. There are a variety of approaches for promoting implementation, including developing research partnerships between practicing clinicians and researchers. In addition to actual research partnerships, I thought it could be helpful and productive to ask a practicing clinician and a researcher to collaborate on the writing of a conference paper that addresses the potential for and barriers to the clinical implementation of the information that was presented in the ANCDs Annual Scientific Meeting. Heather Coles (practicing clinician perspective) and Edie Babbitt (researcher perspective) agreed to write the paper on the morning session, which was on the topic of aphasia. Kaitlyn Dietz (practicing clinician perspective) and Neila Donovan (researcher perspective) agreed to write the paper on the afternoon session, which was on motor speech disorders. These papers are intended to address implementation as it relates to the information presented in the annual conference in particular, not to be comprehensive papers on implementation science, in general. They also do not represent the views of ANCDs as an organization, but reflect the unique perspectives that arose from these collaborative partnerships.

These conference papers can serve several purposes. One purpose is to help clinicians and researchers understand one another's perspectives and cultures. Another purpose is for the authors to explore possibilities for modifying the information that was presented in the talks for clinical use, while still maintaining the fidelity and integrity of the assessment or treatment approach presented. An example of this is the suggestion by Donovan and Dietz that clinicians who do not have access to the sophisticated technology for measuring speech production described by Dr. Stepp could use free software and apps, such as PRAAT or the SPL app for iPhones. There is often a lot of information presented in conference talks, some of which is quite technical. Yet another purpose that these conference papers can serve is for the clinician and researcher to distill the information that could possibly be implemented immediately. An example is Cole's and Babbitt's suggestion that clinicians consider addressing cognitive skills, as well as language skills, when they work with persons with aphasia. Both sets of authors provide suggestions on how to promote implementation of research evidence into clinical practice. I very much appreciate the time, energy, and thought that the authors put into these papers, and I think both practicing clinicians and researchers will find them to be helpful and interesting. I also hope they will foster continued discussion among ANCDs members regarding ways that we, as an organization, can promote the implementation of research evidence into clinical practice.

Implementing Aphasia Research into Clinical Practice

ANCDS 2018 Annual Scientific Meeting
Morning Session on Aphasia:
Presenters Dr. Swathi Kiran and Dr. Sofia Vallila Rohter

Heather Coles, M.A., CCC-SLP
York Wellness and Rehabilitation Institute
Nazareth College
Rochester, NY

Edna Babbitt, Ph.D., CCC-SLP
Shirley Ryan Abilitylab and Northwestern University
Chicago, IL

Author contact information: Heather Coles, hcoles3@naz.edu; Edna Babbitt, Edna Babbitt, ebabbitt@sralab.org

Scientific knowledge is a self-correcting narrative made from the world and our experience of it evolving together. Science and its most challenging problems can be reframed once we appreciate this entanglement.” Adam Frank, The Blind Spot

For many years, a challenge in our field has been to move aphasia treatments out of the research labs and into clinical practice. Dr. Frank’s quote demonstrates that once we appreciate this challenge, then we can begin to reframe the next steps. ANCDS has engaged in a new initiative to address issues that prevent implementation of treatments into real-world clinical practice. Last fall, two talks at the Annual ANCDS conference focused on aphasia recovery and treatments. We will discuss whether the content of the talks could be implemented in clinical practice immediately and if not, what might be some barriers for practicing clinicians to access and implement the content.

Dr. Swathi Kiran is a prolific and sophisticated researcher who has published extensively on language recovery in persons with aphasia. Her talk at the 2018 ANCDS scientific meeting in Boston focused on the state of the science in aphasia research from current theories of neuroplastic recovery to pre- and post-treatment language reorganization in individuals with chronic aphasia. She outlined in specific detail patterns of normal cortical activation and important neural markers for language and further discussed the recovery patterns of left hemisphere and right hemisphere over the first days, weeks, months and years post stroke. Her work suggests that spared regions of the left hemisphere, along with left hemisphere areas not typically associated with language function, may be important for language recovery. Dr. Kiran outlined the potential for developing individualized recovery trajectories and discussed the use of predictive modeling to align treatment approaches with individual patterns of language reorganization within neuronal networks and pathways. Furthermore, her research suggests that executive function, short term verbal memory, and short-term visual memory have a

critical impact on treatment outcomes. This means that language, cognitive, social and neuroanatomical profiles may be generated which will then dictate the most effective assessment and treatment approaches for each person with aphasia. This, in turn, may provide clinicians with highly informed prognostic information, which brings us closer to targeted medicine.

Building on Dr. Kiran's work on recovery, Dr. Sofia Vallila Rohter discussed the importance of cognition and principles of learning as they relate to access and use of language, as well as the impact of learning processes on behavioral interventions for persons with aphasia (PWA). She raised critical questions for clinicians about assessing the integrity of learning mechanisms in individuals with aphasia in order to determine instructional principles which will enhance response to treatment. She further discussed which therapy approaches capitalize on implicit (below conscious awareness) vs explicit (verbal and rule-based) learning. The intersections of attention and memory with language networks were outlined in detail. Addressing executive function and short-term visual and verbal memory may enhance overall language improvement when targeted as part of therapy for PWA. Information about teaching and practice schedules was shared in the context of using iPad technologies (Constant Therapy specifically) to provide optimal training of newly learned treatment tasks.

Opportunities for Immediate Implementation of the Information

Information that may be new to clinicians is the concept that language functions as a network with hubs rather than isolated and specific language functions being localized to specific brain regions (e.g., Broca's area, Wernicke's area, etc). In addition, recovery is likely bilateral (both LH and RH) across a number of regions. It is beneficial for SLPs to understand that non-linguistic tasks seem to have benefit and that using treatment tasks which facilitate increased activation of the right hemisphere may have a positive impact on language recovery. Better executive function and visual and verbal STM result in improved maintenance of gains made through language interventions. Therefore assessment and treatment of these specific cognitive domains is very important for language recovery in PWA.

Another area for more immediate dissemination and implementation is that of using the principles of learning to guide teaching. Typically we have used impairment-based approaches to target language treatment based on results from assessment. We have not examined the impact of the environment and priming or learning principles. Understanding that some individuals may benefit more from implicit learning (skill acquisition through unintentional patterns and habituating) and others may benefit more from explicit learning (intentional acquisition and understanding of rules and knowledge of concepts) is relevant in how we select and teach clients various therapy approaches. Furthermore, understanding those individuals who require errorless vs errorful learning, individualizing latency and types of feedback, and the importance of teaching and practice is critical to optimize treatment outcomes. Both Kiran and Rohter postulate, based on their research, that some of the most severe PWA are the best learners and we may be underestimating their potential for recovery. The words "build," "habituate," "teach," "implicitly engage," and "explicitly explain" are all important terms in the learning literature that could guide clinicians when developing assessment protocols and treatment frameworks to improve access and use of language.

Kiran's and Rohter's research suggests that Constant Therapy may be a very useful tool for increasing the intensity of therapy delivery through home practice and training. PWA may adapt their learning and apply strategies while engaging with the computer tasks and provided with feedback from the program. As an example, PWA may get an item wrong and may learn to listen to the cues, stop, and adjust prior to responding. Clinicians may capitalize on this type of learning to enhance attention, visual and verbal short-term memory and executive functioning which, in turn, may help with generalization of language gains made in treatment. Understanding that we need to make these observations about teaching and practice, along with conducting cognitive assessments, will improve our ability to provide effective and efficient interventions for those living with aphasia.

Barriers/Challenges to Immediate Implementation

The ethics of prognostication for patients with aphasia brings up many questions from both research and clinical perspectives. At first glance, many clinicians may think how helpful it will be to be able to tell patients and their families that, "Based on your lesion, this is how we think you'll recover," instead of what we typically say, which tends to be, "We don't know how much you'll recover" or, more devastatingly, "You'll plateau at six months post-injury." Given the climate of reimbursement for rehabilitation services, much more information is needed about which treatment works for which patients.

Neuroethicists raise the issue of privacy related to brain activity stored in medical records and who has access to that information (Farah, 2015). The concern would be that insurance companies may use information that someone is a "non-responder" to deny services. Before information presented in Dr. Kiran's talk and other research in neuroplasticity could be put into clinical practice, discussions may need to occur as to whether insurance companies would immediately decline to cover treatment for those patients who fell into the "unlikely-to-recover-much" category. For instance, would the "non-responders" in the study (or other studies) make gains with more of the same treatment or a different type of treatment? Many researchers use the terms "responders" and "non-responders" to treatment. It may be important to emphasize that the "non-responders" did not respond to that specific treatment, and it is unknown whether the person would respond to different treatments. There could be a danger to prognosticating recovery if insurance companies begin using algorithms to limit or deny coverage.

It has been noted that patients and families want hope in the prognoses that are provided (Brown, Worrall, Davidson, & Howe, 2012). We don't know if a negative prognosis will impact the person with aphasia to the point that they become unmotivated to participate in therapy. Learned-helplessness may be a consequence of a poor prognosis. For those with severe aphasia, perhaps we don't know yet what treatments (adjuvant or pharmaceutical) will enhance recovery. We are just now beginning to understand resting state, cortical tractography, right hemisphere involvement, and implications for aphasia.

Dr. Kiran noted that the information she was presenting is moving towards future precision medicine and presented some early research regarding possible mechanisms for predicting which persons would benefit from semantic-based treatment. At this stage of the research, these analyses are not available for current practice. More research needs to be completed before algorithms for predicting response-to-treatment can be implemented in the

real world. As a small part of her talk, she mentioned the treatment that was implemented in the study. Perhaps more time should have been given to the description of the treatment protocol for the clinicians' benefit. Understandably, the focus of her talk was the neuroplastic findings following administration of the protocol. There could be debate as to whether an explicit description of the treatment protocol would be beneficial for this type of presentation. We would argue that it is important. If researchers truly want their treatment protocols implemented, then they must provide a description of the protocol to the detail that clinicians can implement upon return to work or clinical instructors can teach the next day. There needs to be more than just a reference to the article that outlines the protocol.

Regarding, Dr. Vallila-Rohter's treatment, there were multiple levels at which implementation feasibility can be evaluated. She described theories of implicit and explicit learning and how that informed a training program for using an iPad. Theories of learning mechanisms may or may not be new to clinicians. The protocol she described for training iPad sequences to access a therapy program was detailed and could be implemented and generalized for other types of computer/tablet programs which follow specific procedures. However, clinicians would need to create their own materials (i.e., steps to follow to access a program or app). She also described an assessment measure. It would be helpful to have that available to clinicians to use with their patients, with a clear description of any instructions for use. It appears it would be most useful in an outpatient or home health setting.

The challenge for presenters is how to balance scientific talks for a broad audience, such as attendees at ANCDs. The technical details of the talk may be inaccessible to some clinicians and researchers. For example, specific and detailed neuroimaging information, while interesting, is not digestible for some. On the other hand, some researchers may be disappointed if that information is not presented and too much emphasis is placed on assessment and treatment. Yet other researchers, as well as clinicians, may not be familiar with the details of a clinical treatment and may desire to see the emphasis of the talks be placed on the treatment protocols. One possible solution for this is to have a "supplementary information" website that attendees could link to through the handouts where more details would be presented.

It is part of the dilemma that a clinician hears information that may have an applicability but thinks "I'm not sure I can boil these concepts down to the most important information". More specifically related to the presentations, how do researchers ensure that the post-stroke data of fMRI mapping is accessible and understandable? It is unclear how clinicians can determine treatment plans related to individualized language networks and the ways in which these networks need to be targeted for optimal improvement. However, the challenge to the researcher is complicated. In order to receive funding for this work, it often requires that investigators employ sophisticated methodologies that are not taught to clinicians in graduate school. The onus is on the researcher to impart the information in a format that is accessible to their audience, while at the same time, it is important for clinicians who work with neurologic communication disorders to have knowledge of recent advances in neuroimaging and profiles of recovery.

Another consideration is the lack of replication in treatment studies. If we are going to make generalizations about responders and non-responders based on sophisticated algorithms, then it is critical to replicate these studies particularly in light of the risk that predictive

modeling may lead to the generation of guidelines for treatment and possibly for reimbursement. Operation of labs is dependent on grant funding sources, such as the NIH, publications in peer reviewed scholarly journals, and presentations at research meetings; however, replicating clinical research is not considered innovative and would not be fundable. Moreover, there is a bias in the scholarly journals against publishing replications (Open Science Collaboration, 2015). In order to further understand and form reliable generalizations about these individualized language and cognitive networks, we will need to overcome this replication bias so that more studies with increased sample sizes can be conducted.

Possible Solutions for Improving Translation of Knowledge

Health organizations and employers would benefit greatly from having dedicated staff who distill evidence-based practice and ensure it's being implemented throughout their clinical staff. Employers supporting memberships in organizations which review, interpret and rate research articles for clinicians may enhance knowledge translation for clinicians. Burkholder (2016) contends that in higher education we may benefit from using a backward design for courses in order to approach the learning process as 'novices.' This may also be relevant for the application to research design and dissemination for clinicians. Researchers and/or clinicians driven to understand current evidence may find it hard to relate to those who do not share the same foundational knowledge or have the time or resources to commit to furthering their practices through additional study. In order for clinicians to achieve optimal outcomes for their patients, can we distill the content to the more basic steps of the approaches (procedural memory) and then build on the understanding and application in order to foster greater critical thinking once the foundational concepts are understood? One approach would be to start with the desired outcomes and then fill in the gaps of knowledge related to the neuroanatomy, recovery, and theoretical underpinnings which drive the evidence.

Researchers may need to start with the initial question "How can I help clinicians understand and implement this work?" In order to guide graduate students, early practitioners, and time-strapped clinicians, researchers can highlight the most important material to facilitate quick learning. Best practices from the literature in adult learning may facilitate learning specific to medical fields (O'Toole et al, 2019; Reed et al 2014). If hands-on learning is a primary mechanism of teaching that facilitates learning, perhaps ASHA needs to require that presentations not only describe research findings related to a treatment, but also include time for detailed description and hands-on practice of that treatment. This highlights the need for researchers to consider implementation practices in presentations of their treatment studies. In order to facilitate more effective and efficient opportunities to digest evidence, clinically-oriented journals could require that articles have bullet points, be shorter, and/or have greater emphasis on clinician take-aways. More frequently clinicians are using online courses. In light of ANCDs' new initiative to address "barriers to implementing effective clinical practices" perhaps ANCDs could offer sessions or courses for clinicians to become more versed in research methodology and interpretation of results. This type of learning may be enhanced through demonstrations, case discussions, or more reading and quizzes for continuing education. Use of case-based discussions may also be an avenue to help 'bridge the gap' or translate the research into clinical application. Starting with what clinicians need to know may be the opportunity for

buy-in from clinicians. In their reality, they need to know how to implement a treatment and how to write goals that will be reimbursed.

For researchers, ANDCS may consider offering sessions that cover topics in andragogy, the art and science of how adults learn (Knowles, 2012). ASHA may require and support implementation methods in grant applications. Specifically, ASHA could require researchers to outline collaborations with practicing clinicians early in the research process and describe plans for dissemination that follow best practices for adult learners. More support from funding sources (NIH, National Science Foundation, Department of Education) for pragmatic trials may contribute to knowledge about best implementation practices Morris and colleagues (2019) describe a framework for moving the field of communication disorders into health services research (HRS) by conducting pragmatic trials. Pragmatic trials, sometimes called practice-based evidence, aim to examine the external validity of treatments in real-world settings (<http://www.crispebooks.org/PragmaticTrials/>). Perhaps organizations and employers should be leading the way to support implementation science. As an organization with aims to increase implementation practices, ANDCS could also require presenters to identify how they have incorporated implementation principles and use adult learning practices to guide their talks.

Summary/Conclusions

In summary, we found both opportunities and challenges for real world implementation of the information presented in both talks. The expert research and wealth of information presented by Drs. Kiran and Vallila Rohter moves our field forward in pursuit of how we can apply knowledge of neuroplastic and learning principles to inform our treatments. It is our hope that both researchers and clinicians will find our analyses helpful and further examination will facilitate greater connections between both. We also hope that it will bridge the gap for implementation of important clinical research into more 'real world' settings.

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Implementing Motor Speech Research into Clinical Practice

ANCDS 2018 Annual Scientific Meeting
Afternoon Session on Motor Speech Disorders
by Presenters Dr. Carla Stepp and Dr. Jordan Green

Neila J. Donovan
Louisiana State University
Department of Communication Sciences and Disorders
Baton Rouge, LA

Kaitlyn R. Dietz
Moss Rehabilitation
Philadelphia, PA

Corresponding Author: Neila J. Donovan, Louisiana State University, Department of Communication Sciences and Disorders, 72 Hatcher Hall, Baton Rouge, LA 70803
Tel: 225-578-3938
Email: ndonovan@lsu.edu

The Academy of Neurologic Communication Disorders and Sciences' (ANCDS) vision is "to ensure that every person affected by neurologic communication disorders receives the highest quality clinical services" (ANCDS website, 2019). One aspect of quality clinical care is appropriate treatment selection. For over two decades ANCDS has been the leader in analyzing and disseminating information on treatments for adults with acquired neurologic disorders to help clinicians make informed decisions about selection of evidence-based treatment (EBT). Thanks, in part to ANCDS' contributions, evidence-based practice (EBP) is the standard for clinicians in Communication Disorders. However, quality clinical service is multifaceted. While it includes the use of EBP the literature reports that the adoption of an EBT is never immediately incorporated into routine clinical practice (Bauer, Damschroder, Hagedorn, Smith, & Kilbourne, 2015). In fact, in medicine the literature has reported that it takes an average 17 years for an EBT to become a part of routine clinical care (Balas & Boren, 2000). There is no known data on the uptake of controlled trials to routine clinical care in Communication Disorders.

More recently, ANCDS has recognized the lack of clinical implementation of the EBP research in acquired neurologic disorders and has begun to look to the field of *implementation science* to identify facilitators and barriers to clinical implementation of controlled treatments. This paper is ANCDS's first attempt to use a clinician/researcher collaboration to comment on research presented at the 2018 ANCDS annual meeting, titled *Advances in Neurological Rehabilitation for Aphasia and Motor Speech Disorders*, in Boston, vis a vis EBP and possible implementation of the speakers' research. Both authors have extensive clinical experience in

adult neurologic disorders and motor speech in particular. As a clinical researcher, NJD has focused on development of novel treatments and treatment outcome measures for people with acquired neurologic communication disorders. The paper begins with a definition and brief explanation of implementation science, followed by a summary of the speakers' presentations, and discussion about ways to reduce the lag time for implementation of EBTs into clinical practice. Finally, we hope that the suggestions we make provide a catalyst for discussions about bridging the gap between EBP and routine clinical practice in adult neurologic disorders.

Implementation Science

Eccles and Mittman (as cited in (Bauer et al., 2015) defined implementation science as “the scientific study of methods to promote the systematic uptake of research findings and other evidence-based practices into routine practice, and, hence, to improve the quality and effectiveness of health services” (p. 3). Bauer and colleagues (2015) explain that implementation sciences is distinct from, but shares elements with quality improvement and dissemination research. Stakeholders, funders and policymakers increasingly expect some sort of implementation strategy for EBT. The authors suggest that most clinical researchers are trained to disseminate their research through publications or presentations but are not trained to examine the variables that will bring their treatments into general clinical practice (e.g. effectiveness, cost-benefit analysis, organizational considerations, or benefit to the public), barriers that impede new treatments from being used in general clinical practice. In addition to the Bauer and colleagues article, please refer to the tutorial by Douglas and Burshnic (2019) tutorial on implementation science for Communication Disorders.

Implementation scientists seek to understand the best methods to implement well-controlled research studies into real world clinical settings which, by their nature, are less controlled than clinical trials, due in part to setting variations, influences of policy-makers, organizational rules and regulations, or even client/family treatment preferences. Clinical researchers typically obtain grants to move treatment development through a phased “pipeline” to establish treatment efficacy (Robey, 2004). Therefore, in the earliest stages of clinical research, implementation of research findings may not be appropriate, although they may be presented or published. And even in later phases, the demand for strict protocol control may not represent clinical realities, and thus, results in an EBT that does not translate to the clinical setting.

Clearly, the lack of clinical relevance could be a significant barrier to a treatment's implementation. By relevance we mean clinical considerations that might include optimal dosage (intensity, frequency and duration), equipment and/or space needed for treatment administration, clarity of protocol, stimuli development, or clinician and/or patient/family. We suggest that clinicians may forego EBTs because they do not know how, nor do they have the time to learn how to implement a treatment. Considering the variety of clinical settings (e.g. hospitals, inpatient rehabilitation centers, outpatient rehabilitation clinics, or skilled nursing facilities) and the productivity standards set for clinicians, it is often more efficient for a clinician to rely on what works rather than introduce something new. Moreover, implementation science also requires organizational and policy support. For example, if a treatment is not reimbursable, a clinician will not adopt it. As stated earlier, EBP is now the standard of care—speech-language pathologists (SLPs) and audiologists are committed to

finding evidence-based assessments and treatments they can implement for their clients. In fact, in many settings professional advancement (e.g., promotion to senior speech-language pathologist) and reimbursement by payors depends on clinicians using evidence-based practice. Therefore, it is critical that strong collaborative relationships between clinical researchers and clinicians be established to ensure that the treatments being designed are not only evidence-based, but clinically feasible.

Presentation Summaries

In the following summaries of speakers' presentations, we aim to identify the facilitators and barriers to clinical implementation of the research presented by Cara Stepp, Ph.D., Boston University in *Voice and Speech in Parkinson's Disease: Motor Control, Physiology, and Acoustics* and Jordan Green, Ph.D., Massachusetts General Hospital Institute of Health Professions in *Speech Analysis for Medical Diagnostics: From Senses to Sensors*. Within each summary we attempt to answer the question, "Could the information (e.g., treatment approach, analysis, procedures) presented in the talk be incorporated into clinical practice tomorrow?" However, we recognize that not all research being disseminated can be implemented immediately.

Dr. Cara Stepp – Voice and Speech in Parkinson's Disease: Motor Control, Physiology, and Acoustics

Dr. Stepp's presentation described the speech subsystems, compared and contrasted the etiological bases of limb-motor versus motor speech signs, and then presented current evidence for assessment and treatment in voice and speech for people with Parkinson's disease (PD). We recognize that Dr. Stepp's research is in the early phases of development and that implementation will require further research. However, in reviewing the presentation, we thought that most clinicians would welcome objective measurement of the speech subsystems if they were readily available, easy to learn and use, and not costly. However, to obtain many of the measures described by Dr. Stepp, expensive equipment and/or additional personnel would be required, which would create a number of barriers to implementation for most clinicians. First, implementation of this system would require a significant investment of resources to purchase and house the equipment. Unless the caseload includes a sufficiently large number of patients with motor speech disorders, hospital administrators may be reluctant to allocate resources especially in the face of decreasing reimbursement dollars for health-care. If a clinician was interested in obtaining some of the objective measures described by Dr. Stepp, there are now free apps and software available (e.g. PRAAT for acoustic analysis (<http://www.fon.hum.uva.nl/praat/>); iPhone Sound Pressure Level app) that might replace expensive acoustic analyses software and sound pressure level meters. The second barrier is lack of expertise. Learning to operate equipment and interpret the results takes time away from one's clinical productivity. In most clinical settings, productivity is a metric of job performance and thus pay; therefore, it might be difficult for clinicians to justify taking time away from caseload demands. Third, it would be difficult to demonstrate the benefits of the investment in equipment to what is done now in clinical practice (i.e., using perceptual measures of speech such as loudness or naturalness), and estimating speech intelligibility. As Dr. Stepp moves this research through the "pipeline" consideration of these barriers could be beneficial when it comes time to implement her findings into clinical practice.

Despite the barriers, we came away with two pieces of research that clinicians who treat people with PD could implement immediately. Dr. Stepp presented data that compared the reliability of measuring speech intelligibility by scoring a speech intelligibility test or having other speakers rate speech intelligibility on a visual analog scale. Speech intelligibility tests have strong validity and reliability, but are somewhat labor intensive. However, Dr. Stepp demonstrated that using a very small number of listeners provided a reliable estimate of speech intelligibility. The second implementation came from the evidence that Lee Silverman Voice Treatment (LSVT) – LOUD™ compared to LSVT – ARTIC™ produced significantly better outcomes over a longer period of time than LSVT-ARTIC™. This finding may result in more appropriate treatment selection, as well as decreased costs for the patient and insurance provider.

Dr. Jordan Green – Speech Analysis for Medical Diagnostics: From Senses to Sensors

Dr. Green acknowledged that his work does not have current clinical applications. However, while discussing his future research he presented possible ways his work could be used in clinical settings. The major barrier to the immediate implementation of the work Dr. Green presented was the amount of equipment used and the space needed to house the equipment. As stated above, administrators equate equipment, training, and space outlays as significant expenses, which is a significant barrier to clinical implementation. Furthermore, most of the training clinicians would have to have to operate the equipment could not be obtained through traditional continuing education outlets.

However, a number of Dr. Green’s findings could be clinically useful. First, he shared a speech subsystem model of intelligibility loss over the course of disease progression in amyotrophic lateral sclerosis (ALS), which indicated that articulatory changes were the most prominent throughout the disease. Using this data, Dr. Green suggested that optimizing articulation could be the most efficacious treatment goal for maintaining intelligibility, which has immediate clinical implications for practicing clinicians. Dr. Green also shared research regarding use of Iowa Oral Performance Instrument (IOPI) for lip strengthening in the facial transplant population. While there is a low incidence rate of facial transplants, this approach is certainly feasible for those working on motor speech recovery with this client population. Lastly, while Dr. Green utilized technology not readily available for practicing clinicians his study looking at articulation rate in primary progressive aphasia (PPA) further confirmed articulation rate as a useful diagnostic tool for motor speech involvement in PPA. Clinicians could incorporate this evidence into their assessment repertoire immediately.

Discussion/Conclusion

An evidence-based practice/implementation dilemma clearly exists, which slows progress toward meeting the needs of people with neurologic communication disorders. However, clinicians have options in the clinical setting. Hopper (2007) provided clinicians with guidance on how to implement an EBT with modifications and how to choose a treatment when no evidence exists. Wambaugh (2007) provided a framework for collecting “practice-based evidence” whereby a clinician could use basic research principles to collect data on a treatment he/she modified to meet a specific client’s need. For example, a clinician could design a single-subject designed (SSD) study to determine if a treatment would improve a client’s performance

on a task. Single-subject design requires establishing a stable baseline, training task to criteria with the treatment, and then gathering post-treatment data (same as baseline). While this is an oversimplification of SSD, it might serve as a catalyst to get clinicians thinking about how they could collect practice-based evidence to justify treatment choice.

The reality is that closer collaboration between researchers and clinicians could alleviate some of the gaps that exist between evidence-based assessments and treatments and the realities of clinical practice and thus, the lag time from EBP research to clinical practice. We suggest that without that collaboration the slow uptake from research to clinical practice will continue. The problems seem obvious, the solutions do not—that is where implementation science comes in. Perhaps it is time for researchers and clinicians to sit down together and address barriers to evidence-based practice implementation. Learning opportunities, such as the ANCDs Scientific Meeting provide researchers and clinicians to come together and discuss state of the art research. However, implementation needs to be discussed explicitly at such meetings. It might be useful for conference planners to include a panel at the end of each presentation moderated by someone with an implementation science perspective where presenters and clinicians discuss the facilitators and barriers of implementing the research presented. Another possibility would be for clinicians to offer to collaborate with researchers to provide “clinical feasibility” input into their grant proposals. However, clinicians could only offer if the opportunities were presented to them by researchers.

Unfortunately, change is driven from the top down, not the bottom up—at organizational levels. We have three suggestions for organizational change. At the funding level (e.g. NIH), one solution to the implementation dilemma might be for granting agencies to reward clinical research studies that include an implementation scientist and a practicing speech-language pathologist on the research team, at the appropriate research phase. At a minimum a research team should have input from someone with implementation expertise to develop both implementation and dissemination plans. At the association level, clinicians might lobby the American Speech Language Hearing Association (ASHA) to ask that a brief discussion of clinical implementation be a scored element of proposals for poster and platform presentations when applicable. At the university level, including some component of implementation science in the training curriculum could be beneficial. Certainly, we recognize that some research will not be ready for implementation when it is presented, as is the case with the two examples in this paper. In that case, it would be beneficial for research teams to suggest a clear technical path or provide a roadmap to implementation down the line.

It has taken over two decades for evidence-based practice to become part of the curriculum in university programs and the recognized standard of care. Many SLPs are now relatively well-versed in where to find and how to use evidence-based practice. Yet, many clinicians in the field continue to use treatments without an evidence base or that have been contra-indicated (e.g., oral motor exercise training). Perhaps it is time to consider training aspects of implementation science in the university curriculum whereby we would reach future clinicians and future researchers in neurologic communication disorders.

In conclusion, researchers and clinicians work under different sets of restraints that make their coming together difficult, but not impossible. Beginning researcher clinician collaborations at the earliest phase of research possible could address the clinical realities that may prevent an EBT from being incorporated into clinical practice more quickly, such optimal

and/or reimbursable treatment dosage, or replicability of the treatment protocol. Until these collaborations begin to occur, we run the risk of having a wealth of evidence that cannot be used to improve the lives of our clients with neurologic communication disorders.

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