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MISSION:
Empowering our members by providing opportunities for professional development, advocacy, and leadership development necessary to foster excellence in the services provided to individuals with communication and related disorders.

HISTORY:
Founded in 1945, the Ohio Speech-Language-Hearing Association (OSLHA) is a professional association representing speech-language pathologists and audiologists throughout Ohio. OSLHA is recognized by the national American Speech-Language-Hearing Association (ASHA) as the official professional organization for Ohio. OSLHA members provide services for the evaluation and rehabilitation of communicative disorders. Members work in a variety of settings including: clinics, health care facilities, hospitals, private practice, schools, and universities. Members must abide by the OSLHA Code of Ethics.

eHearsay, the electronic journal of the Ohio Speech-Language-Hearing Association, is designed to address the professional development needs of the state association. Issues are developed around specific themes and can include invited papers, research articles, review, tutorial, research forum, letter to the editor, clinical focus/forum or viewpoints.

eHearsay is published as a web journal annually. Continuing education credits will be available for each issue.
Welcome!

The theme of this issue is **Supervision & Clinical Education**. According to Merriman-Webster On-line (n.d.), supervision is defined as “the action, process, or occupation of critical watching and directing activities or a course of action”. Clinical education refers to programs that provide professionals-in-training with practical and skill oriented instruction under the supervision of a certified and licensed professional.

At some point in their career, many speech-language pathologists (SLP) or audiologists may be engaged in a role as a clinical instructor or clinical supervisor in a variety of settings (e.g., job shadow/observation, university clinic, externship, clinical fellowship year, fellowship/residency, etc.). In this position, the SLP or Audiologist is responsible for evaluating the supervisee’s practical application of academic knowledge, proficiency in application of treatment techniques, quality of communication and competency in client/patient care.

This issue of **eHearsay** contains six (6) articles that are related to supervision and clinical education. The first article is by Martine Elie & Tiffany Phoenix. They are discussing the implications of generational differences on clinical supervision. The next article, by Lisa D’Angelo examines Interprofessional education related to assessment of concussion. Whitney Schneider-Cline presents a workshop approach to improve clinical writing in graduate student clinicians. Gabriela Simon-Cereijido, Erica Ellis, and Mary Kubalanza discuss student clinician education in an early education classroom. The fifth article (Robin Edge & Bess Sirmon-Taylor) talks about using ethics in evidence based practice. The last article on supervision is by Michael Dillon. He discusses ways to improve the clinical education model via the shared perspective.

The remaining three (3) articles are also very exciting. Margaret Lehman Blake describes the language and pragmatic deficits associated with right hemisphere brain damage. Damage to the right cerebral hemisphere (RHD) can cause a variety of cognitive and language impairments that affect the efficiency and effectiveness of communication. Dr. Blake discusses several treatment options for RHD.

Voice therapy encompasses a myriad of techniques employed in the management of voice disorder or achieving a specific gender intonation. The article by Lauren Timmons and Edie Hapner will guide SLPs through the development and selection of voice therapy goals and interventions utilizing a physiologic approach to treatment using two case studies.

Tracheotomies are one of the most commonly performed hospital surgeries for one of three reasons: to bypass an obstructed upper airway, to clean/remove secretions from the airway and to easily/safely deliver oxygen to the lungs. Typically, they are performed in emergency situations for critically ill patients. Nathan Thorp provides a review of the relevant anatomy and physiology and important implications for speech and swallowing. He also discusses the benefits of multidisciplinary tracheostomy teams.

Wishing you love, laughter and many blessings!

**Laurie M. Sheehy**

eHearsay Journal Editor
Deficits of Language and Pragmatics Associated With Right Hemisphere Brain Damage

Margaret Lehman Blake

Abstract
Damage to the right cerebral hemisphere (RHD) can cause a variety of cognitive and language impairments that affect the efficiency and effectiveness of communication. Broadly speaking, the various deficits can be summarized by the idea that people with RHD can have difficulty with intended meaning and with using communicative context. Language comprehension processes that can be affected by RHD include semantic processing of words and phrases, interpreting meaning within a linguistic context, generation of some inferences, and interpretation of some forms of non-literal language. Language production deficits are heterogeneous and do not follow any specific pattern. Several treatment approaches that may be useful for addressing the communication deficits are discussed.

Margaret Lehman Blake, Ph.D. is employed at the University of Houston.
Financial – Professor in the Department of Communication Sciences and Disorders at the University of Houston (Texas). Royalties are received from the publication of a book on right hemisphere disorders.
Nonfinancial – Research interests includes cognitive-communicative disorders associated with right hemisphere damage. Has authored a book and numerous chapters on right hemisphere disorders. Has presented nationally and internationally on evidence based practice for disorders associated with right hemisphere damage.

Learning Objectives
1) Identify two language processes that can be impaired after right hemisphere stroke
2) Describe how to use contextual cues to enhance understanding of intended meaning
3) Define theory of mind

Damage to the right cerebral hemisphere (RHD) can result in a variety of deficits that affect cognitive processes and communication abilities. While cognitive deficits such as anosognosia (reduced awareness of deficits) and visuospatial processing have been linked to the right hemisphere for close to a century (Babinski, 1914 as translated by Langer & Lavine, 2014; Heilman, Bowers, Valenstein, & Watson, 1986); prosodic and emotional processing was described in the 1940s. However, the idea that the right hemisphere had any contributions to purposeful, propositional language was not widely considered until the 1960s (Perecman, 1983).

It is now fairly widely recognized (at least within some clinical fields) that the right hemisphere (RH) does have a substantial role in some language processes, and that patients with RHD can have significant communication deficits that impact their ability to successfully return to their pre-stroke social and vocational roles. One way to think about the RH’s role is that it does what Google Translate cannot. Google Translate does well with words, sentences, syntax, and can handle some very common idioms or metaphors. However, it cannot convey nuances of meaning conveyed by specific phrases, or prosodic contours that convey meaning through phrasing, pauses, emphatic stress, and emotional tone. Additionally, meaning conveyed through non-verbal cues of facial expression, gesture and body language obviously is lost when communication is written only.

Research suggests that language comprehension processes that can be affected by RHD include semantic processing of words and phrases, interpreting meaning within a linguistic context, and generation of some inferences. Deficits in interpretation of non-literal language such as metaphors, idioms, and sarcasm, also have been reported. Language production deficits are harder to pin down, but impact the efficiency and effectiveness of communication. Finally, pragmatic
deficits impact social interactions in a variety of ways. Broadly speaking, the various deficits can be summarized by the idea that people with RHD can have difficulty with intended meaning and with using communicative context. It is critical to remember that not all people with RHD will have these deficits. At this point, there are no clear patterns of co-occurrence, so knowing that a patient has a deficit in pragmatics does not aid in predicting what other communication or cognitive deficits she may also have. This review will be focused on a rather small group of the broad array of communication disorders associated with RHD. Language comprehension, language production, and pragmatics will be discussed separately, but it should become clear fairly quickly that there is much overlap in the areas themselves (e.g., language production and pragmatics) as well as in the underlying impairments and the broader consequences.

Language Comprehension.

Three aspects of language comprehension have been empirically studied: suppression of alternative meanings, activation of related features, and interpretation of non-literal language. Tompkins and colleagues conducted a series of studies through which they developed and tested the suppression deficit hypothesis (Tompkins, Baumgaertner, Lehman & Fassbinder, 2000; Tompkins, Lehman & Baumgaertner, 1999; Tompkins, Lehman-Blake, Baumgaertner & Fassbinder, 2001). According to this hypothesis, RHD can cause inefficient or slow suppression (inhibition) of meanings that are inappropriate for a given context. The way ‘normal’ comprehension works, when you hear or read a word, a variety of meanings and features of that word are automatically activated in your brain. For the word ‘bat’, for example, both the animal and the baseball meanings of the word are automatically activated. When the word appears in a sentence such as ‘He saw the bat’, both meanings remain activated until some additional context helps to disambiguate the intended meaning. In a sentence such as ‘he swung the bat’, the unintended meaning (animal), is suppressed by the brain so that the intended meaning (baseball) is the most highly activated meaning and the sentence can be quickly interpreted (Kintsch, 1988). Some adults with RHD have a suppression deficit, in which the suppression process is slow or inefficient. This slowing is related to their overall comprehension ability indicating that the slight delay in suppressing the unintended meaning can have broader impacts on language comprehension.

The suppression deficit is not limited only to ambiguous words, but also to ambiguous phrases (Tompkins et al., 2001). The phrase “it took her a while to get used to her new name” could refer to a woman who had recently gotten married and changed her name, but also could describe a woman in a witness protection program. Given contextual support for the second (but less common) meaning, some adults with RHD are slower to switch their interpretation away from the newlywed meaning, and this slowing is related to general comprehension.

Another semantic processing deficit is referred to as a coarse coding deficit. Beeman (1998) suggested that left hemisphere language processing can be described as fine coding: rapid activation and selection of the most dominant meanings and features, whereas the right hemisphere processing was more coarse, with slower activation of both dominant and subordinate meanings and both common (close) and uncommon (distant) features. Remember that when you read or hear a word, various meanings of that word are automatically activated. Additionally, various features of that word also are activated. Thus, hearing the word blouse results in activation of features such as sleeves, buttons, fabric, collar, and possibly silk or wrinkled. If the word appeared in a conversation about having to spend time ironing a blouse, the feature ‘wrinkled’ would be important. If you had not initially activated the concept of ‘wrinkled’, then your comprehension of the conversation would be slightly slowed as your brain would need to activate that concept to tie into the emerging picture. Some adults with RHD are less likely to activate distantly-related features, and this is related to general comprehension (Tompkins, Fassbinder, Blake, Baumgaertner, & Jayaram, 2004; Tompkins, Fassbinder, Scharp, & Meigh, 2008; Tompkins, Scharp, Meigh & Fassbinder, 2008).

While it can be interesting to understand the underlying deficits that can impair comprehension, speech language pathologists (SLPs) typically quickly respond to this description with the question: So what can we do about it? The Contextual Constraint Treatment was designed to treat suppression and coarse coding deficits. Tompkins and colleagues (Blake, Tompkins, Scharp, Meigh & Wambaugh, 2015; Tompkins, Blake,
Wambaugh & Meigh, 2011; Tompkins, Scharp, Meigh, Blake & Wambaugh, 2012) created a treatment in which the intended meaning – conveyed through ambiguous words or distant features of unambiguous words – was emphasized through context. The purpose of the treatment was to implicitly increase processing of contextual cues that would speed up the suppression or coarse coding processes. The overarching goal was to improve general comprehension. While the initial studies had promising results, the treatment requires computerized presentation, individualized programming, and precise timing. None of these are easily transferrable to daily SLP practice, and so unfortunately, this treatment is not currently ready for ‘prime time’.

The use of context for interpretation of meaning has been examined more broadly than suppression and coarse coding. A variety of studies have examined the function of the RH versus left hemisphere. In one study, researchers evaluated processing of statements that can be false in some contexts but true in others (Menenti, Petersson, Scheeringa & Hagoort, 2008). The statement *you can see better at night*, when presented in isolation, is considered to be false. However, if it appears in a description of astronomers looking at stars, it becomes true. The intact RH appears to be more active during interpretation of sentences such as this in which the veracity depends on the context in which it appears. This finding needs to be explored directly in adults with RHD to determine whether interpretation is affected and how it impacts general comprehension. Additional research into how to remediate the problem, if it exists, also would be needed.

One last aspect of comprehension is the generation of inferences. Early work suggested that inferencing deficits were common after RHD. However, there are many different types of inferences (see Lehman & Tompkins, 2000 for a review). Some are relatively ‘easy’, and can be generated automatically. Bridging inferences, those that are necessary to link adjacent sentences, are essentially automatic for almost everyone. They also are not affected by RHD.

Elaborative inferences are those that are not necessary for basic comprehension, but that expand the interpretation or understanding. These inferences are not automatic, and can be affected by RHD. Examples of bridging and elaborative inferences are provided in Table 1. As with suppression and coarse coding deficits, deficits in inference generation can impact overall comprehension, which makes them important for SLPs to understand. Unfortunately, there are no tested treatments for enhancing generation of inferences.

Deficits in comprehension of non-literal language such as metaphors, idioms, and sarcasm/irony have long been central to the stereotypical description of an adult with RHD. Despite the pervasiveness of this stereotype, results from research with non-brain-damaged adults indicate that the RH is not dominant for non-literal language processing; rather, such processing relies on a bilateral network. The LH is more strongly activated with familiar idioms or metaphors, which would have a common, set meaning. The RH involvement increases with novel phrases, when a phrase is embedded into context, and when deeper semantic processing is required (Yang, Fuller, Khodaparast & Krawczyk, 2010).

<table>
<thead>
<tr>
<th>Table 1. Examples of bridging and elaborative inferences</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTEXT</td>
</tr>
<tr>
<td>Bridging Inference</td>
</tr>
<tr>
<td>Maria put the finishing touches on the dinner for Juan. She knew her husband would love the enchiladas.</td>
</tr>
<tr>
<td>Elaborative Inferences</td>
</tr>
<tr>
<td>Marcel was glad to be nearly finished building the bookcase. He picked up his hammer to put in the last screw.</td>
</tr>
<tr>
<td>LaTosha’s daughter was inconsolable. She calmed down only when she found her pacifier.</td>
</tr>
</tbody>
</table>
After RHD, some individuals have difficulties with metaphor interpretation; although such problems likely to be more evident if the metaphors are unfamiliar, presented without supporting context, or involve a comparison between two items that are typically disparate (e.g., ‘the ice was a pillow’ vs. ‘the snow was a pillow’) (see Blake, 2018 for a review).

In terms of idioms, deficits are most often reported in the research for picture-idiom matching tasks or for tasks requiring definition of idioms (Myers & Linebaugh, 1981; Myers & Mackisack, 1986; Papagno, Curti, Rizzo, Crippa & Colombo, 2006; Tompkins, Boada & McGarry, 1992). In some studies, the same people who had difficulty defining idioms were able to automatically recognize them when they were embedded in a context (Tompkins et al., 1992). Several factors influence the ease of idiom interpretation including the familiarity and whether or not the idioms are decomposable – if the non-literal meaning can be derived from the words. For example, ‘she’s got salt in her pumpkin’ is not decomposable because the meaning - she’s intelligent – cannot be derived from the words in the phrase. If presented with an unfamiliar, non-decomposable idiom, adults without brain damage typically give a rather literal definition as there is no way to guess the true meaning.

One last type of non-literal language is sarcasm. This differs from metaphors and idioms in several ways. First, while there are finite numbers of metaphors and idioms, sarcasm is essentially unconstrained. Nearly any word or phrase can be used sarcastically, depending on the context. Second, in sarcasm the intended meaning is the opposite of the literal meaning which can cause conflict in determining the appropriate interpretation. Although there are only a few studies of interpretation of sarcasm after RHD (Giora, Zaidel, Soroker, Batori, & Kasher, 2000), the general consensus is that it can be impaired.

In summary, the RHD plays a role in activation of word meanings and features, and damage to the right hemisphere can result in inefficiencies that affect comprehension more broadly. The RH also is important for interpreting intended meaning within a context, which can affect non-literal language processing.

There is only one study that directly examined treatment for non-literal language interpretation deficits (Lundgren, Brownell, Cayer-Meade, Millone & Kearns, 2011). In this treatment, features associated with the target nouns in comparative metaphors (e.g., the snow was a pillow) are generated and then those that overlap (e.g., fluffy, soft) would be used to derive the meaning (e.g., the snow was soft & fluffy). While participants in the study did improve in interpreting metaphors, there was no measure of everyday comprehension or communication to determine whether the gains created functional changes.

Other suggestions for treatments to enhance comprehension of intended meaning – of ambiguous words, phrases, or non-literal language – are theoretically based on what we know about these processes and how they may be affected by RHD. These suggested treatments have yet to be empirically tested, so their efficacy and effectiveness are presently unknown. Results from research described above indicates that adults with RHD can use strong contextual cues to guide predictions and other inferences (Blake, 2009a, 2009b; Blake & Lesniewicz, 2005). The repeated use of contextual cuing can also facilitate suppression of inappropriate meanings and relevant, distantly-related features (Blake et al., 2015; Tompkins et al., 2001). As intended meanings are derived from context, it seems reasonable to emphasize context in treatment, and focus attention on contextual cues that can aid in determining intended meaning (see Blake, 2018 for a more detailed account).

Treatment might proceed as follows: Provide a novel idiom that is unfamiliar to the client (translated foreign language idioms work well), such as ‘to spit the toad’. Do not ask them to define it, as this may create an erroneous meaning. Embed the idiom into a short paragraph with strong contextual support that and ask the client to interpret the meaning. In this case, the paragraph could be something like “Hana had promised her brother Haruto that she wouldn’t tell their parents that he had brought his girlfriend over afterschool, but she felt guilty about hiding it from her parents, so Hana spit the toad.” which should aid the client in determining the meaning of the idiom: to tell a secret. The client should then be asked to identify all of the cues in the context that led to the interpretation (e.g., promised not to tell, hiding from parents, felt guilty).

A similar method can be used with ambiguous words or phrases; once embedded into a biasing context, clients
can be instructed to identify cues that suggest one meaning is more appropriate than another. Depending on the level of the clients, they can be asked to generate contexts that would disambiguate meanings (e.g., write two sentences using the word yard, one which conveys the measurement meaning and the other the property meaning).

**Language Production.**

There is a relatively large number of studies of language production at the discourse level. At least 34 aspects of production, including coherence, cohesion, efficiency, and organization have been examined across at least 24 studies (e.g., Barnes & Armstrong, 2010; Brady, Armstrong & Mackenzie, 2005 & 2006; Chantraine, Joanette & Ska, 1998; Ferré, Fonseca, Ska & Joanette, 2012; Hird & Kirsner, 2003; Mackenzie, Begg, Brady & Lees, 1997 & Mackenzie, Begg, Lees & Brady, 1999). Discourse samples have been obtained through a variety of tasks including picture description, story retelling, procedural discourse and conversations. As shown in Table 2, there are few clear patterns of performance in the most common discourse elicitation tasks. Conflicting results across studies may reflect differences in the task demands, such as telling a story vs. re-telling a story, the naturalness or familiarity of the task or situation, or the make-up of the pool of participants in terms of size of lesion, overall severity of deficits, age, or presence of other cognitive and/or communication deficits. The few consistencies suggest that adults with RHD may exhibit deficits in emotional content and pragmatic aspects of conversation.

Despite the number of studies of non-literal language comprehension, as described above, there has been only one examining production of these linguistic devices (VanLancker Sidtis & Postman, 2006). Overall, the five RHD participants produced fewer instances of figurative language compared to those without brain damage or with LHD, but the group differences disappeared when examining only idioms and conventional phrases.

Language production is rarely conducted without a target audience, which links it closely to pragmatics, the next topic of discussion. Since it is difficult to separate these two concepts, evidence and ideas to guide treatment will be discussed together after a review of pragmatics.

**Pragmatics.**

Broadly defined, pragmatics refers to the use of language in context. Early use of the term focused primarily on the expression and understanding of meaning and intent primarily within the realm of language. More recently, the phrase ‘social communication’ has been used to expand the concept of pragmatics to include verbal and nonverbal aspects of communication and knowledge of social rules of communication (Turkstra & Politis, 2017). McDonald (2017) suggests that pragmatics more often refers to a person’s skills, while social communication encompasses the effectiveness of a communicative exchange. There are a variety of aspects of pragmatics that can be affected after RHD, and a variety of ways to cover the topic. For these purposes, three aspects of social communication will be covered here: theory of mind, empathy, and humor. Theory of mind often is conceptualized as a cognitive process, but because it has a direct impact on communicative interactions, it will be the lead topic under pragmatics. Empathy and humor are not often covered in discussions of RHD or pragmatics, yet they often can be critical aspects of interpersonal relationships. Thus, they are also included here as a reminder that sometimes what is most difficult for spouses and families are changes that may not be apparent to clinicians and other rehabilitation professionals who did not know the patient prior to the stroke.

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**Table 2. Summary of studies of discourse production after RHD.**

<table>
<thead>
<tr>
<th></th>
<th>STORY TELLING</th>
<th>PICTURE DESCRIPTION</th>
<th>CONVERSATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coherence/Cohesion</td>
<td>WNL</td>
<td>Conflicting</td>
<td>WNL</td>
</tr>
<tr>
<td>Structure</td>
<td>WNL</td>
<td>WNL</td>
<td>Conflicting</td>
</tr>
<tr>
<td>Content</td>
<td>Conflicting</td>
<td>Conflicting</td>
<td>WNL</td>
</tr>
<tr>
<td>Productivity</td>
<td>Conflicting</td>
<td>Conflicting</td>
<td>WNL</td>
</tr>
<tr>
<td>Appropriateness - # emotional words</td>
<td>Impairment</td>
<td>Impairment</td>
<td>n/a</td>
</tr>
<tr>
<td>Non-Verbal (e.g., eye contact, turn-taking)</td>
<td>n/a</td>
<td>n/a</td>
<td>Impairment</td>
</tr>
</tbody>
</table>

*Notes: WNL = within normal limits; Conflicting = conflicting results across studies; Impairment = RHD participants impaired in relation to control participants.*
Theory of mind (ToM) is the understanding that other people have thoughts, feelings, ideas, and viewpoints that may differ from your own (Happé, Brownell & Winner, 1999). ToM can be divided into cognitive and affective components. Cognitive ToM includes thoughts, ideas and viewpoints, whereas affective ToM concerns feelings and emotions (Shamay-Tsoory, Tomer, Goldsher, Berger & Aharon-Peretz, 2004). Both components are subserved by a relatively large bilateral network that connects regions of the frontal, parietal, and temporal lobes (Hillis, 2014).

There is conflicting evidence from the few studies that have examined theory of mind (ToM) after RHD (Happé et al., 1999; Surian & Segal, 2001; Tompkins, Scharm, Fassbinder, Meigh & Armstrong, 2008). One critical issue is that the assessments for ToM involve (a) involve visual stimuli (videos or cartoons) which requires exclusion of participants who have unilateral neglect or visuospatial processing deficits; or (b) complex scenarios with multiple characters that can be cognitively demanding. Thus, poor performance may reflect a co-occurring deficit rather than a theory of mind impairment. Balaban and colleagues (Balaban, Friedmann & Ziv, 2016; Balaban, Friedmann & Ariel, 2016) examined ToM and language production in a group of participants with RHD. They found that those with deficits of theory of mind were more likely to have problems with the use of referential language. These issues interfered with the correct usage of pronouns (e.g., only after establishing the referent) and in using the right amount of information to avoid ambiguities, such as using defining characteristics to refer to only one of two girls in a photograph.

Empathy is the ability to “recognize, share in, and make inferences about another person’s emotional state” (Hillis, 2014, p. 981). The network controlling empathy, not surprisingly, overlaps extensively with the ToM network. Studies conducted by Shamay-Tsoory and colleagues (Shamay-Tsoory, Tomer, Berger & Aharon-Peretz, 2003; Shamay-Tsoory et al., 2004) indicate that deficits in empathy and ToM can occur from damage to either right or left frontal lobes, but only occur after parietal damage in the right hemisphere. Affective empathy may be affected more often from right hemisphere than left hemisphere lesions. Hills and Tippett (2014) administered questionnaires to stroke survivors and their spouses/caregivers two years post stroke to determine what deficits were deemed the most important. Changes in empathy were rated by 50% of spouses/caregivers as very important. There were no other deficits that were very important for more than 50% of participants. Thus, while changes in empathy likely are not routinely evaluated by SLPs or even mentioned in family education sessions, this may be an area that deserves more attention.

One final area that likely has substantial effects on interpersonal interactions and relationships is humor. Humor often relies on (a) recognition of a disconnect and (b) resolving the disconnect to reveal a surprising and funny reinterpretation. Puns are a good example of linguistic humor. Understanding the humor in the headline Graveyard Security Left to Skeleton Crew requires re-interpretation of the word ‘skeleton’ to refer to a set of bones as opposed to a small number of workers. As described above, adults with RHD may have difficulty in re-interpreting meanings, which may help explain the deficits in humor comprehension. Another explanation is that humor often relies on ToM: understanding what someone else knows about a situation may be necessary for interpreting a statement as humorous instead of serious (Cheang & Pell, 2006; Winner, Brownell, Happe, Blum & Pincus, 1998). Finally, Brownell and colleagues (Brownell, Michel, Powelson & Gardner, 1983; Bihrl, Brownell & Powelson, 1986) suggested that the problem may lie in re-interpreting the context in order to find a coherent link between the body of a joke and the punchline.

As with the non-literal language research, most of the work on humor focuses on comprehension. Production of humor in naturalistic conversations was evaluated by Heath and Blonder (2003, 2005). They found that while attempts at humor occurred equally often for adults with LHD and RHD, the spouses of the RHD participants more often reported a change in the use and appreciation of humor following stroke. As with empathy, humor likely is not a primary area of concern for SLPs. However, humor often can be a key part of interpersonal interactions and relationships, and may be an area that should be considered more often.
Treatment for language production and pragmatic deficits.
It is difficult to make strong recommendations for treatments for language and pragmatic deficits in adults with RHD because there are no treatment studies specifically for such deficits associated with stroke (Blake, 2007). The best evidence comes from treatments designed for adults with traumatic brain injury.

Dahlberg and colleagues (2007; Braden et al., 2010) developed the Group Interactive Structured Treatment to enhance adults’ social competence following brain injury. The program is facilitated by an SLP and a Social Worker, who approach social competence issues from slightly different perspectives. The program includes an emphasis on self-awareness and self-assessment, and education about and practice with communicating needs/thoughts, listening, non-verbal communication, regulating emotions, respecting social boundaries and working with others. The group setting provides opportunities for feedback from peers and a natural setting for practicing communicative interactions and problem solving issues when they occur. Families are also involved to facilitate generalization outside the program. Positive gains have been reported for various aspects of pragmatics as well as ratings of social competence. More information about the treatment can be found at http://www.braininjurysocialcompetence.com/

Researchers and clinicians from Australia have developed many resources and programs to improve communication after TBI (Togher, McDonald, Tate, Rietdijk & Power, 2016; Togher et al., n.d.) Training both survivors and their communication partners is essential, as partners can quite easily, and often unintentionally, make communication more difficult or less successful. Checklists and videos of positive and not-so-positive strategies are available on their TBI Express website http://sydney.edu.au/health-sciences/tbi-express/index.shtml.

Conclusions.
There has been slow but steady progress towards understanding the role of the RH in language and communication. The progress towards development of treatments for deficits associated with RHD has been slower, but there are avenues for developing theoretically based treatments, and opportunities to capitalize on the work done in TBI. ♦

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Implications of Generational Differences on Clinical Supervision: Supervising Millennials

Martine Elie & Tiffany Phoenix

Abstract
Clinical supervision can be defined as “a distinct area of practice in Speech-Language Pathology and is an essential component in the education of students and the continual professional growth of Speech-Language Pathologists”, (ASHA, 2008a, p.1). Clinical supervision is a vital part of the education of future speech-language pathologists and audiologists; however, until recently, this has become a required continuing education unit for both professions. While the conceptual model and pedagogy on supervision has not changed, generational differences and characteristics of each generational group have resulted in differences in communication styles which may impact the student-supervisee relationship. The article discusses the implications of generational differences on clinical supervision at the level of graduate externships as well as, employment.

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Financial – Clinical Director in the Department of Communication Sciences and Disorders at Howard University.
Nonfinancial - Research interests include: communication disorders/child language, Haitian Creole, speech and language development, multicultural issues and clinical management.

Tiffany Phoenix, M.S. is employed at Howard University.
Financial – Clinical Instructor in the Department of Communication Sciences and Disorders at Howard University.
Nonfinancial – Nothing to disclose.

Learning Objectives
1) Describe generational groups
2) Discuss strategies and techniques that can be used to improve communication between the groups
3) State the impact of generational differences on clinical education

Clinical supervision is an integral part of academic and clinical education as well as, the training process for graduate clinicians pursuing degrees in the professions of Speech-Language Pathology and Audiology. Students in respective Speech-Language Pathology and Audiology programs must work with clinical supervisors/educators, and/or preceptors as they work with clients. The overall goal of clinical supervision is to prepare graduate clinicians to provide equitable services to their patients/clients. As designed, the process of clinical supervision advances graduate clinicians from novice therapists to independent practitioners, acquiring the skills of clinical methodology, clinical decision-making, evidence based practice, data collection/reporting, as well as professional communication. As such, clinical supervision has been recognized as a distinct area of practice requiring essential knowledge and skills (ASHA, 2013; CAPCSD, 2013). ASHA’s Ad Hoc Committee on Supervision (ASHA, 2013) developed mandatory areas of knowledge and skills required of individuals engaging in clinical training. While there are three specific categories of knowledge and skills specific to clinical education, each of these are broad categories and include: Overarching Knowledge and Skills, Knowledge and Skills Specific to Student Training in the University Clinic or Off-site Setting, and Knowledge and Skills Specific to the Clinical Educator Working with Students in the Culminating Externship in Audiology. The knowledge and skills specific to clinical education include but are not limited to: communication, collaboration, demonstrating clinical decision-making, evidence-based practice, cultivating professional growth and development, analyzing performance, bridging theory to practice, and self-reflection.
Generational groups (i.e., people born and/or living at about the same time) are said to have common characteristics. According to the New Dictionary of Cultural Identity (2002), as cited in McCready (2007), generation gap refers to “the differences in customs, attitudes and beliefs between any two generations, but especially between youth and adults” (p. 434). While the notion of generational differences is not unique to our profession, the relative issues that result from these factors affect all professionals across the domains of expectations, communication, employment, and relationships. Generational differences have been reported to present unique challenges in clinical education (ASHA, 2013).

According to ASHA (2017; Table 1), ASHA members range in age from about 25 to 95 and belong to five different generations. Generation X makes up the largest share of the ASHA membership (42 percent), followed by the Baby Boomers (29 percent), Millennials (27 percent) and Silent and G.I./Greatest Generations (2 percent).

The ASHA (2017) report at a glance statistics support Lancaster and Stillman’s (2002) statement, “there are four separate and distinct generations working shoulder-to-shoulder and face-to-face in a stressful, competitive workplace.” Each generational group is defined by events, places, people, and symbols that immensely influence their expectations and value system. Consequently, because these four groups share differences in customs, attitudes, and beliefs, generation gaps exist (Hirsch, Kett, & Trefil, 2002). These generation gaps can result in unstated assumptions and attitudes, misinterpretations, and conflict that can easily originate from the age and generational differences that exist among these groups. As a result, these differences present very peculiar challenges in the area of clinical education. In order to understand the challenges presented because of these generation gaps, it is important to have a knowledge base of the characteristics associated with each group. The table below (Table 2), from Kerins and Matrangola (2012), depicts the common stereotypes from the different generations.

Table 1. ASHA at a glance December 2017

<table>
<thead>
<tr>
<th>Generation</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Millenial</td>
<td>27</td>
</tr>
<tr>
<td>Generation X</td>
<td>42</td>
</tr>
<tr>
<td>Baby Boom</td>
<td>29</td>
</tr>
<tr>
<td>Silent and G.I./Greatest</td>
<td>2</td>
</tr>
</tbody>
</table>

Note: The graphic excludes ASHA associate and National Student Speech Language Hearing Association (NSSLSHA) members.
Sources: ASHA membership data, year-end 2016, and specialized analysis conducted by ASHA’s Surveys and Analysis unit.
Table 2. Common Stereotypes from the Different Generations

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Strict collegial standards</td>
<td>Questioned the status quo</td>
<td>Seek bottom line</td>
<td>Tech-savvy</td>
</tr>
<tr>
<td>“We” generation</td>
<td>Rebellious</td>
<td>Balance home and work life</td>
<td>Respect must be earned</td>
</tr>
<tr>
<td>Trust in government and authority</td>
<td>Driven and dedicated</td>
<td>Demand clear expectations</td>
<td>Consumers</td>
</tr>
<tr>
<td></td>
<td>Self-worth in job</td>
<td></td>
<td>Immediate feedback</td>
</tr>
</tbody>
</table>

More detailed characteristics from each generational group adapted from the work of Elliott-Leary (2017) are provided below. Traditionalists (1900-1945) typically embrace patriotism, adhere to a military management style, save their money, are slow to change their work habits, adapt to more efficient ways of doing things, and are less technologically proficient. Baby Boomers (1946-1964) typically have a strong work ethic, are self-assured, goal centric, resourceful, mentally focused, team oriented, disciplined, and competitive in the workplace. Generation X (1965-1980) typically are independent, resourceful, self-sufficient, value work life balance, value freedom and responsibility in the workplace, may display disdain for authority and structured work hours, do not like to be micromanaged, and embrace a hands-off management philosophy. Millennials (1981-1999) are typically multitaskers, connected, tech savvy, want instant gratification and recognition, want work life balance and flexibility, are team oriented, and enjoy collaborating and building relationships with colleagues. There are very distinct and evident differences among these groups. These differences if not understood and acknowledged can result in misunderstandings and misinterpretations between the clinical supervisor and the supervisee regarding various aspects of the clinical process. While there are certainly very unique differences, clinical supervisors should be very cautious in assuming that all individuals of a particular generation have a “collective personality” which can be defined as a group’s consistent behaviors across various times and contexts. According to McCready (2011), the majority of undergraduate and graduate students are millennials. While most Communication Sciences and Disorders (CSD) students are Millennials, clinical supervisors are typically members of the Baby Boomer, Generation X, and Millennial Groups. Therefore, it is prudent for both clinical supervisors and students to be knowledgeable about the beliefs and expectations associated with each generational group as these differences can lead to a breakdown in communication and expectations. Lancaster and Stillman (2010) as cited in Kerins and Matrangola (2012), stated, “of all the generations in the workforce today, Millennials are most different ...and have been cited as the toughest generation to work with” (p.76). Given the large number of millennials in both academic programs and the workforce, it is important for clinical supervisors to not only know the characteristics of this group but also to have strategies specific to their generational communication style and expectations when working with them.

While it is noted that the beliefs and values of millennials are not tremendously different from those of previous generations, surveys conducted over the last five years identified these two plausible factors: (1) keen intuition of technology as a totally consolidated means of interacting with the world around them and (2) “their expectation of organizational accommodations, stemming from their prior experiences and the degree to which institutions have made themselves malleable to the needs and desires of this cohort” as distinguishing characteristics of this group (Hershatter & Epstein, 2010, p 211; The Pew Research Center, 2007). The relationship that Millennials have with technology has changed the way they know and view the world around them, and the way they interact. Consequently, their relationship with
Technology has also affected the way Millennials will lead and expect to be led in an organization or institution. Therefore, supervisors need to be cognizant of the challenges that this creates in the clinical supervision process and use it as an opportunity to connect with members of this group in ways that may be different from how they connect with members of their own or previous generations. The second factor that distinguishes Millennials from members of previous generations is “their expectation of organizational accommodations, stemming from their prior experiences and the degree to which institutions have made themselves malleable to the needs and desires of this cohort” (Hershatter & Epstein, 2010, p. 211).

Because the needs and desires of Millennials have been met since their younger years, they have been described as the “largest, healthiest, and most cared-for generation in American history” (Howe & Strauss, 2000, p. 76). As a result of the nurturing that their parents have provided them, they may require some assistance in navigating interpersonal communication, specifically learning how to manage conflict and accepting constructive criticism (Dolezalek, 2007, as cited in Shaw & Fairhurst, 2008).

As the field of Speech-Language Pathology involves a high degree of interpersonal communication, it is extremely important for clinical supervisors to understand the implications of generational differences on the overall supervision process. Clinical supervisors need to take into consideration the lens through which they judge cultural and generational characteristics, dispel myths that apply to various generations, accept differences that may influence them, and work to bridge the cultural divide that affects communication. The following suggestions for clinical supervisors adapted from the ASHA leader (2011) can be used as a way to bridge the gap when working with diverse generations:

- Expand knowledge and understanding of defining events and values of the generational group of clients, students, colleagues, and administrative staff
- Be aware of the potential generational differences among groups
- Examine one’s own professional and work setting relationships to determine miscommunications or assumptions made on the basis of generational differences
- Avoid the assumption that all members of a generation have a “collective personality”
- Be familiar with myths associated with each generation and dispel those myths
- Appreciate the strengths of each generation
- Share generational stories about important events and people that have influenced their expectations and value system
- Avoid judging members of other generations for having different values
- Have explicit discussions with student supervisees about generational characteristics that may lead to misunderstandings in relationships with clients and supervisors

In a university clinic or extern setting, the following strategies are recommended as ways to bridge the gap between Clinical Supervisors and Millennials:

- Talk about generational differences during clinic or departmental orientation
- Supplement verbal feedback with written feedback using a Supervisory Log
- When making edits or editing suggestions to written work, use tools like “Track Changes” or other document editors
- Use written lesson plans to prepare and create structure
- More feedback is better
- When providing feedback, use open ended questions and not just suggestions
- Provide both written and verbal feedback
- Establish clear expectations and discuss at the beginning of the supervisory process
- During clinic orientation, provide student with a binder containing pertinent clinic information (i.e., dress code, lesson plan and report samples, sample schedules, etc.)
- At the beginning of the supervisory process, have student to set 3 professional and personal goals that you will review with the student at midterm and final
- Discuss professional language appropriate to setting, between colleagues, clients, and population served
- Address issues of potential confidentiality
- Discuss appropriate use of titles and preferences and don’t assume the student will know
- Encourage students to use evidence-based practice and be sure they understand why this is so imperative
- Have them share journal articles from class or ones they have researched that are related to specific clients on their caseload

Applications of some of the strategies mentioned above and others adapted from Kerins and Matrangola (2012) are listed below (Table 3).

**Table 3. Recommended Strategies**

<table>
<thead>
<tr>
<th>Suggestions for the business world (Durkin 2008)</th>
<th>Applications for clinical supervision</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Put information in writing:</strong> Millennials are used to seeing their conversations in writing and are used to tracking and saving information that way.</td>
<td>Using a supervisory log can be beneficial to supplement verbal feedback with written feedback.</td>
</tr>
<tr>
<td><strong>Create outlines and agendas:</strong> Millennials want to be able to anticipate what will happen</td>
<td>In early clinical learning, written lesson plans are beneficial for preparation and to create structure.</td>
</tr>
<tr>
<td><strong>Be direct and straightforward:</strong> Millennials thrive under deadlines and clear instructions.</td>
<td>More feedback is always better.</td>
</tr>
<tr>
<td><strong>Make them accountable:</strong> Provide Millennials with lists of tasks to accomplish.</td>
<td>Set expectations from the start and discuss these with your student.</td>
</tr>
<tr>
<td><strong>Tell them why:</strong> Millennials are not accustomed to bowing to authority and expect to understand why decisions are made.</td>
<td>Encourage them to use evidence-based practices.</td>
</tr>
<tr>
<td><strong>Ask for feedback:</strong> Tell Millennials what went wrong and discuss how they can improve.</td>
<td>Regular feedback should include open-ended questions rather than just suggestions.</td>
</tr>
</tbody>
</table>

- Encourage students to do a weekly formal written self-reflection at the end of the session, day, or week.
With the increasing number of millennials entering clinical education programs and the profession, continued awareness of generational differences and its potential impact on student supervisee relationships is key to success. Knowledge of the characteristics, communication, styles, and values of the millennial group can help shape the relationship between the clinical educator and student. Furthermore, it can also have an impact on daily dialogue (i.e. clinical expectations, and constructive feedback). Application of the suggested strategies can lead to ease of communication between groups. While this is relevant to current day students, we can expect that there will be differences with the next generation of students.

References


Durant-Jones, L. and Kwiatkowski, S. (2013). We can work it out: student-initiated strategies to facilitate cross-generational supervisory interactions. SIG 11 Perspectives on Administration and Supervision, 23, 70-77.


Demystifying Voice Therapy

Lauren K. Timmons & Edie R. Hapner

Abstract
This article will guide clinicians through the development and selection of voice therapy goals and interventions utilizing a physiologic approach to treatment. A brief overview of the evolution of voice therapy will be provided followed by a discussion of physiologic voice therapy and a tutorial on goal development. Two case studies will be presented to illustrate the development of physiologic voice therapy goals and the selection of corresponding voice therapy interventions.

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Nonfinancial – Nothing to disclose

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Nonfinancial – Nothing to disclose

Learning Objectives

1) Define the physiologic approach to voice therapy
2) State appropriate voice therapy goals based on the synthesis of information from the patient history, perceptual evaluation, laryngeal imaging, and medical diagnosis
3) State appropriate therapy methods based on specific voice therapy goals

Per its title, the primary focus of this article is to “demystify” voice therapy. That is, the goal is to shed light on the actual process of deciding how to treat a patient once they have been evaluated. With this goal in mind, the article will provide a succinct overview of the history of voice therapy, an explanation of physiologic voice therapy, a brief description of the comprehensive voice evaluation, and a tutorial on how to interpret and synthesize the findings of a voice evaluation in order to form a clinical hypothesis, develop corresponding voice therapy goals, and select therapy tools to achieve those goals.

The Evolution of Voice Therapy
Over the past century, the field of voice therapy has significantly evolved. Changes in our approach to voice therapy have been reflective of both the technology available to us to evaluate the voice and developments in our scientific understanding of the physiological underpinnings of voice. In the early 1900s, care of the disordered voice in the U.S. was primarily left to physicians, singing teachers, and acting/voice and diction coaches. In the 1930s, the now-renowned speech pathologist Charles Van Riper was the first to suggest that behavioral treatment of voice disorders follow a medical model rooted in the understanding of the anatomical, physiological, and emotional foundations of voice as they were understood at his time (Van Riper, 1954). Much of voice treatment in its early stages utilized a hygienic approach to therapy, in which the clinician sought to identify maladaptive or unhealthy vocal behaviors and encourage the patient to abandon such behaviors in favor of more vocally healthy habits (Stemple, Glaze, & Klaben, 2000). Today, it is understood that vocal hygiene is typically not sufficient as a stand alone treatment for voice disorders, but it is still frequently used as one element of a comprehensive approach to voice care (Carding, Horsley, & Docherty, 1999; Roy et al., 2001; Behrman, Rutledge, Hembree, & Sheridan, 2008; Rodriguez-Parra, Adrian, & Casado, 2011).

In the 1970s, Daniel Boone described an approach to voice therapy focused on altering aberrant vocal behaviors by specifically targeting those behaviors (Boone, 1971). For example, if a voice sounded strained, the therapy target would be to reduce strain in the voice. This approach is referred to as the symptomatic
approach, and many of the facilitating techniques described by Boone continue to be used today within the context of a modern, eclectic approach to voice therapy (Boone, McFarlane, Von Berg, & Zraick, 2013). A psychogenic approach to voice therapy was described by Arnold Aronson in the early 1980s, which considered the effects of psychological issues, such as anxiety, on the voice (Aronson, 1980).

In the late 1980s, laryngeal videostroboscopy became more widely available for use in a clinical context and allowed clinicians to view important parameters of vocal function, such as glottal closure and vocal fold pliability (Bless, Hirano, & Feder, 1987). With increasing clinical use of videostroboscopy into the 1990s (Woo, Colton, Casper, & Brewer, 1991), the speech-language pathologist’s approach to voice therapy significantly evolved, reflecting the crucial role of laryngeal visualization in treatment planning. At the same time, considerable advances were made in our ability to clinically measure acoustic and aerodynamic capabilities of the voice (Behrman & Orlikoff, 1997; Titze, 1994). Given these advances, speech-language pathologists were better able to synthesize information from patient history, acoustic and aerodynamic capabilities, and functional parameters from laryngeal videostroboscopy, which ushered in the age of physiologic voice therapy.

Physiologic voice therapy, a term first used by Stemple et al. (2000), aims to modify the physiology of voice production in order to improve vocal quality and vocal function, increase vocal efficiency and comfort, and increase vocal endurance. Our ability to use a physiologic approach to therapy is due, in part, to advances in our ability to assess the physiological underpinnings of voice, and it relies on a robust understanding of vocal mechanics, including the subsystems of voice and the integration of these systems: respiration, phonation, resonance, and articulation. The respiratory system is the power source for voice production. Exhaled air passes through the vocal folds, setting them into motion, and serves as the driving force for vocal fold vibration. Phonation refers to vocal fold vibration, which provides the sound source for the voice by generating sound waves. The resonatory system is responsible for shaping the sound created by the vocal folds into what we perceive as the human voice. The articulatory system shapes sound into recognizable speech by creating vowels and consonants based on the location of the articulators. Resonance and articulation have upstream and downstream effects on the voice (Titze, 2008).

The balanced integration of these subsystems is what gives rise to a healthy voice. Disruption to or imbalance among any of these subsystems can cause dysphonia, and in cases of disordered voice, we consider the functionality of each of these subsystems and their relationships to one another. When the respiratory system is not functioning optimally, as in a case of insufficient respiratory drive or breath holding, vocal quality can be altered. Insufficient respiratory drive or inconsistent airflow may lead to a quiet and/or rough voice, while breath holding may result in a voice that sounds strained or pressed. Likewise, impairments in the phonatory system can alter voice quality; incomplete glottal closure can cause a voice to be breathy, while irregular vibration or reduced pliability of the vocal folds can result in a rough vocal quality. Some resonatory postures, such as a posteriorly focused resonance, can reduce vocal efficiency and require greater effort and collision forces at the level of the true vocal folds. Articulation similarly has a downstream effect on vocal fold vibration, as the sounds made in the mouth impact vocal fold (glottal) closure due to non-linear source-filter interactions (Titze, 2008).
Voice Evaluation and Laryngeal Videostroboscopy

With the intent to explore how to determine physiologically based voice therapy goals and match those goals to appropriate therapy tools, this article focuses heavily on the physiologic components of voice assessment. However, the physiologic assessment must be completed within the context of a comprehensive voice evaluation, considering the unique factors associated with each patient. The major components of a comprehensive voice evaluation include patient history, perceptual and instrumental assessments, medical diagnosis, and trial therapy or stimulability testing. Each of these components must be considered and synthesized when developing a treatment plan, but a detailed description of all components is beyond the scope of this article. For additional information about the comprehensive voice evaluation, the reader is referred to the American Speech-Language-Hearing Association (ASHA) Practice Portal for Voice Disorders (n.d.), as well as recent articles by Patel et al. (2018) regarding instrumental assessment and Roy et al. (2013) regarding evidence-based clinical assessment.

Laryngeal imaging has been described as the most important element of an instrumental assessment for voice therapy, and it is critical to the development of a physiologically sound treatment plan (Patel et al., 2018). However, it can sometimes be difficult for the speech-language pathologist to adequately access to videostroboscopy, the speech-language pathologist may complete videostroboscopy to assess vocal function. If the physician does not have access to videostroboscopy, the speech-language pathologist may complete videostroboscopy to assess vocal function and to assist with voice therapy planning. For the speech-language pathologist, videostroboscopy is the preferred method of laryngoscopy for several reasons (Patel et al., 2018). First and foremost, videostroboscopy allows for visual-perceptual assessment of phonation, including parameters of regularity/periodicity, vocal fold vibratory amplitude, mucosal wave, vocal fold phase symmetry, vertical level, and glottal closure pattern, which cannot be seen with plain light examination due to the frequency at which the vocal folds vibrate (Patel et al., 2018). Speech-language pathologists use this crucial information about function to inform therapy planning (see section entitled Clinical Hypothesis and Voice Therapy Goals for further description). Second, the use of videostroboscopy by specialized voice teams has been shown to improve diagnostic accuracy (Stachler et al., 2018). This is relevant to the speech-language pathologist because a change in diagnosis can alter the recommended course of treatment. In the common event, the otolaryngologist completes videostroboscopy without the speech-language pathologist present, it is best practice, as recommended in the AAOHNS guidelines, for the physician to share the video recording with the speech-language pathologist for assessment of vocal function and treatment planning (Stachler et al., 2018). It is important to remember that the physician and speech-language pathologist use this imaging for different purposes, and a diagnosis, description of the larynx, or still images will not suffice for the speech-language pathologist to adequately assess vocal function. If the physician does not have access to videostroboscopy, the speech-language pathologist may complete videostroboscopy to assess vocal function and to assist with voice therapy planning. Of course, if imaging is completed by the speech-language pathologist, it must be shared with the otolaryngologist for diagnosis (ASHA, n.d.; Stachler et al., 2018). Completion of the videostroboscopic examination and interpretation of the functional parameters of phonation are within the scope of practice of the speech-language pathologist if the clinician is trained and competent in these specific skills (ASHA, n.d., 2004, 2016).
Clinical Hypothesis and Voice Therapy Goals

After all elements of the comprehensive voice evaluation have been completed, the speech-language pathologist must synthesize the available information in order to develop a clinical hypothesis regarding a suitable treatment plan. The clinical hypothesis considers what physiological changes can be made to improve voice quality of life for the patient. First and foremost, one must decide whether voice therapy will be an effective tool in changing the physiological impairments that have been identified, either as a primary or complementary treatment modality. Though most patients with voice disorders can likely benefit to some extent from voice therapy in terms of maximizing voicing efficiency and reducing vocal effort, voice therapy is not appropriate as a first line of treatment for all patients. For some patients, voice therapy alone may not be expected to cause a sufficient change in function and it may need to be combined with medical treatment, such as surgery. Other patients may only require medical treatment and not require voice therapy at all due to a sufficient increase in function from other treatments.

When considering the ability to make physiological voice changes, it is important to understand the nature of the diagnosis of the patient. Speech-language pathologists treat function rather than lesions, but understanding benign vocal fold lesions and other voice disorders allows the speech-language pathologist to anticipate the kinds of physiological changes that are possible in voice therapy. For example, vocal fold nodules, by definition, are bilateral lesions that respond to voice therapy with a reduction in size or complete elimination of the lesions (Rosen et al., 2012). Thus, by making changes in voice therapy such as reducing vocal effort and phonotrauma while increasing voicing efficiency, we expect that the lesions will begin to reduce in size as the patient makes progress towards these functional voice therapy goals. A vocal fold cyst, however, is a lesion that is not expected to resolve with voice therapy, but voice therapy can still have a role in pre- and post-operative care if surgery is planned. In addition to understanding diagnoses, it is valuable for the speech-language pathologist to understand medical treatments that may be used contemporaneously or sequentially with voice therapy. It is recommended that the speech-language pathologist communicate with the referring physician to understand the patient’s overall plan of care and the role of voice therapy within that comprehensive plan. For further information about voice disorder diagnoses, the reader is referred to the Classification Manual of Voice Disorders (Verdolini, Rosen & Branski, 2012).

More important than understanding a diagnosis, the speech-language pathologist must be able to interpret the functional voice parameters of videostroboscopy. The parameters of regularity/periodicity, vocal fold vibratory amplitude, mucosal wave, vocal fold phase symmetry, vertical level, and glottal closure pattern indicate potential underlying causes of dysphonia and suggest the physiological changes that can be made in therapy. For example, a breathy voice may be caused by a large glottal gap, such as from severe vocal fold atrophy or a unilateral vocal fold paralysis. Voice therapy cannot close a large vocal fold gap or make a paralyzed vocal fold move, but therapy can be used to improve respiratory management and strength, decrease vocal effort, improve voicing efficiency, and increase vocal endurance. A physiological problem with the mucosal wave, such as in vocal fold scarring, is another problem that cannot be “cured” by voice therapy. However, it is possible to improve voicing efficiency, resonance, and decrease vocal effort despite not being able to restore mucosal wave function. When impairments such as severe supraglottic muscle tension and/or a long closed phase are observed on videostroboscopy, the speech-language pathologist can identify those as physiological problems that are amenable to voice therapy.

Once it has been determined that voice therapy is appropriate for the patient, it is time to develop goals. When developing goals, consider the most salient physiological and functional impairments and possible solutions. For example, does the patient seem to have difficulty with managing breath (e.g. breath holding, reduced vocal loudness) when speaking? Perhaps consider a goal for respiratory/phonatory coordination. Does the patient report increased vocal effort, fatigue, or pain with voicing? Consider goals to help alleviate unnecessary circumlaryngeal muscle tension. Does the voice sound pressed or strained? A goal to optimize glottal postures and/or reduce muscle tension may be needed. When one begins to consider the primary causes of a specific patient’s voice problem, it is possible to start matching problems to solutions. Table 1 is provided below with examples of goals. For ease, it is organized by diagnosis. Often, specific physiological
problems are associated with specific diagnoses. Always keep in mind, however, that speech-language pathologists treat function, and impairments of any kind may be seen in any patient regardless of diagnosis. Develop goals purposefully and with the specific patient in mind.

**Voice Therapy Interventions and Tools**

Once patient-specific goals have been developed, it is time to select interventions and tools to achieve those goals. Physiologic voice therapy can include both direct and indirect interventions. A direct intervention is defined as, “Any intervention that modifies vocal behavior through motor execution, somatosensory feedback, and auditory feedback” (Van Stan, Roy, Awan, Stemple & Hillman, 2015, p.111). Examples of direct interventions that are categorized as physiologic interventions include vocal function exercises, resonant voice therapy, and phonation resistance training exercises. Indirect interventions are defined as, “Any intervention that modifies vocal behavior through modification of cognitive, behavioral, psychological, and physical environments in which voicing occurs” (Van Stan et al., 2015, p. 111). Examples of indirect interventions include counseling and vocal hygiene.

Selection of interventions should be patient-specific, just as goals are patient-specific. Physiologic voice interventions are not one-size-fits-all and should be used purposefully, based on a certain goal. Sometimes, similar voice therapy goals require vastly different therapy tools. For example, discoordination of respiration and phonation is often observed in patients with a variety of diagnoses, but a single tool does not exist that is appropriate for all patients.

**Table 1. Examples of possible goals for voice therapy**

<table>
<thead>
<tr>
<th>DIAGNOSIS</th>
<th>POSSIBLE GOALS FOR TREATMENT*</th>
</tr>
</thead>
</table>
| Phonotraumatic mass/lesion or edema (e.g. vocal fold nodules, polyp, cyst)** | • Maximize vocal efficiency and reduce vocal effort  
  ○ Reduce extralaryngeal muscle tension  
  ○ Optimize glottal postures  
  ○ Improve respiratory/phonatory coordination  
  • Improve voice quality  
  ○ Increase oral locus of resonance  
  ○ Optimize glottal postures  
  ○ Improve respiratory/phonatory coordination  
** As a result of therapy, reduction or elimination of lesions may occur due to positive physiological changes (e.g., in cases of vocal fold nodules and some hemorrhagic polyps) (Rosen et al., 2012; Klein et al., 2009). Sometimes, an initial course of therapy is helpful for reducing acute phonotrauma and edema to determine further treatment. Reduction in edema is a result of positive physiological changes. |
| Phonotrauma with no mass/lesion (e.g. ectasias, varices) or pre/post-operative treatment | • Maximize vocal efficiency and reduce vocal effort  
  • Prepare for managing voice rest after surgery  
  • Prepare for return to occupational voice needs  
  ○ Increase vocal endurance |
| Primary MTD (sometimes referred to as functional aphonia) | • Establish normal voicing  
  • Generalize normal voicing in all speaking situations  
  • Reduce vocal effort, fatigue, and/or pain and maximize vocal efficiency |
| Glottal Incompetence (e.g. vocal fold atrophy) | • Maximize respiratory/phonatory coordination  
  • Maximize vocal efficiency and reduce vocal effort |
| Secondary MTD | • Reduce/eliminate secondary physical manifestations of the primary diagnosis (e.g., pain, tension, fatigue) |

*This is not an exhaustive list of voice therapy goals.
Phonation resistance training exercises (PhoRTE) (Ziegler et al., 2014) utilize loud voicing to target respiratory/phonatory coordination and are used in cases of glottal incompetence, typically paresis or atrophy. These exercises are often used with the intent to power up the respiratory system. Patients with phonotraumatic vocal fold lesions may also have a goal related to increasing respiratory/phonatory coordination, but PhoRTE, which promotes greater glottal closure, would not be an appropriate treatment for someone with phonotrauma. Resonant voice therapy or conversation training therapy (CTT) could be appropriate choices instead (Gartner-Schmidt et al., 2016). Often, multiple therapy tools exist to target the same problem. In these cases, more is typically not better. It is best to find the one tool that works for the patient in front of you and use that tool. For example, a number of semi-occluded vocal tract (SOVT) exercises are available to improve glottal postures, reduce the sensation of vocal effort, and increase voicing efficiency. However, it is not necessary for the patient to learn 10 different types of SOVT exercises when one or two will suffice. If multiple tools are available for your selected goal, be comfortable trying appropriate tools until you find the one that works best for your patient. Table 2 includes voice therapy interventions and possible goals for which they might be used.

Case Studies
Two case studies are presented below. Information regarding the patient history, perceptual evaluation, instrumental evaluation, and medical diagnosis are available for review. While reading through each case study, begin to develop a clinical hypothesis and consider potential treatment options for the patient.

Case Study 1: Patient M
Case Overview & History of the Problem.
Patient M, a 19-year-old female college student, presented to an inter-professional voice center with complaints of increased vocal effort, vocal fatigue, a “raspy” vocal quality, and intermittent voice loss. She experienced short periods of voice loss (1-2 days) almost weekly following periods of moderate or high voice use, such as on the weekends. Onset of symptoms reportedly began approximately 3 months prior to evaluation, at the start of a new semester at school. Patient M reported her voice first started sounding raspy around the age 10, but she did not typically experience voice fatigue or voice loss. She occasionally lost her voice after periods of extended voice use.

<table>
<thead>
<tr>
<th>Reduce muscle tension and vocal effort</th>
<th>Improve oral resonance</th>
<th>Decrease breath holding and improve respiratory/phonatory coordination</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manual Therapies</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Circumlaryngeal Massage</td>
<td>• Resonant Voice Therapy</td>
<td>• Flow phonation</td>
</tr>
<tr>
<td>• Myofascial Release</td>
<td>• Conversation Training Therapy (CTT)</td>
<td>• Cup bubbles</td>
</tr>
<tr>
<td>• Laryngeal Manipulation</td>
<td>• Lessac Madsen Resonant Voice Therapy (LMRVT)</td>
<td>• Conversation Training Therapy (CTT)</td>
</tr>
<tr>
<td><strong>Direct Therapies</strong></td>
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<tr>
<td>• See “Improve oral resonance”</td>
<td></td>
<td></td>
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<tr>
<td>• See “SOVT Tasks”</td>
<td></td>
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</tbody>
</table>

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<thead>
<tr>
<th>Increase respiratory/phonatory coordination via exuberant therapy</th>
<th>Improve impedance matching and achieve optimal glottal postures</th>
<th>Establish voice in a patient with primary MTD (sometimes referred to as functional aphony)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Semi-Occluded Vocal Tract (SOVT) Tasks</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Straw phonation (regular or stir straw)</td>
<td></td>
<td>• Vegetative or non-speech sounds (throat clear, cough, gargle, laugh)</td>
</tr>
<tr>
<td>• Straw phonation in water</td>
<td></td>
<td>• Masking</td>
</tr>
<tr>
<td>• Cup phonation</td>
<td></td>
<td>• Inhalation phonation</td>
</tr>
<tr>
<td>• Semi-occluded lip postures: lip trills, tongue trills humming, voiced fricatives, kazoo buzz</td>
<td></td>
<td>• Manual therapies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Voice Therapy Boot Camp</td>
</tr>
</tbody>
</table>

*This is not an exhaustive list of voice therapy interventions and tools.*
such as cheering at sporting events or concerts. Patient M had not previously sought voice care prior to this evaluation. At the time of evaluation, Patient M reported she was experiencing a more severe period of voice problems following a busy weekend.

**Voice History.**

Patient M was a freshman college student active in a variety of clubs and activities. Academically, she used her voice for in-class discussions and presentations. She described herself as a “talker” and reported significant social voice use. During the week, most of her voice use was in small group conversations. She reported heavy voice use in large groups and noisy environments on the weekends, such as at restaurants, parties, and sporting events. Three months prior to evaluation, Patient M’s voice became more “raspy” and she began experiencing increased vocal effort. She started losing her voice for 1-2 days at a time following weekends of heavy voice use. Patient M did not have a history of formal voice training. She drank 4-5 glasses of water per day, 3 cups of coffee per day, and reported alcohol consumption on weekends (4-5 drinks per weekend night). She reported she did not have a history of smoking.

**Medical History.**

Patient M reported a history of seasonal allergies for which she took Zyrtec.

**Social History.**

As a freshman college student, Patient M reported a busy social and academic life and described herself as quite talkative. She lived in an on-campus dorm with one roommate. Patient M reported that it was very important for her to be able to interact with and talk to those around her.

**Patient Self-Assessment.**

Patient M was administered a series of patient-reported outcome measures to better assess the impact of her voice problem on quality of life and daily functioning. Indices were selected based on apparent clinical utility for Patient M.

- **Voice Handicap Index-10 (VHI-10):** 22/40 (scores greater than 11 indicate impaired voice quality of life) (Rosen, Lee, Osborne, Zullo, & Murray, 2004; Arffa, Krishna, Gartner-Schmidt, & Rosen, 2012)
- **Voice Catastrophization Index (VCI):** 22/52 (higher scores indicate greater catastrophization) (Shoffel-Havakuk, Chau, Hapner, Pethan, & Johns, 2017)
- **Vocal Fatigue Index (VFI)** (Nanjundeswaran, Jacobson, Gartner-Schmidt, & Verdolini Abbott, 2015)
  - **Tiredness and Avoidance:** 35/44 (greater than or equal to 24 suggests vocal fatigue/voice problem)
  - **Physical Discomfort:** 14/20 (greater than or equal to 7 suggests vocal fatigue/voice problem)
  - **Improves with Rest:** 9/12 (less than or equal to 7 suggests vocal fatigue does not improve with rest)
- **OMNI Vocal Effort Scale** (Shoffel-Havakuk, Marks, Morton, Johns, & Hapner, in press)
  - **Current vocal effort in conversation:** 8.5/10 (hard to produce voice)
  - **Effort in group social situations:** 10/10 (extremely hard to produce voice)

**Perceptual and Instrumental Evaluation.**

**Auditory Perceptual.**

The Consensus Auditory Perceptual Evaluation of Voice (CAPE-V) was administered (Kempster, Gerratt, Verdolini Abbott, Barkmeier-Kraemer, & Hillman, 2009). The patient received an overall CAPE-V score of 85/100, indicating a dysphonia of a severe nature. Aberrant perceptual features identified in the voice included primary breathiness (CAPE-V: 74/100) with secondary roughness (CAPE-V: 63/100) and strain (CAPE-V: 57/100), as well as frequent phonatory breaks. Overall, vocal loudness was reduced in a quiet environment (CAPE-V: 57/100). Resonance was focused in the epilaryngeal region. Respiration appeared to be primarily thoracic with evidence of breath holding. In conversation, Patient M spoke at a rapid rate and on expiratory reserve volume.
Manual Palpation.
Manual palpation indicated:
- elevated larynx with reduced flexibility greater on the left side
- moderately narrow thyrohyoid space
- moderate tension at the suprahoid muscles on the left
- mild tension at the suprahoid muscles on the right
- mild tension at the base of tongue
- moderate tension at the sternocleidomastoid muscles bilaterally

Acoustic and Aerodynamic Assessment.
It is best practice to include acoustic and aerodynamic assessment as part of the comprehensive voice evaluation (Patel et al., 2018). These measures provide valuable information, which may not be obtained through perceptual assessment or laryngeal imaging, to help further elucidate the physiological underpinnings of a voice problem (Behrman & Orlikoff, 1997). Unfortunately, acoustic and aerodynamic equipment is not always available to clinicians. Though not most ideal, it is still possible to develop a physiologically based clinical hypothesis in the absence of this information. For the purpose of demonstrating how to develop a treatment plan when access to acoustic and aerodynamic equipment is limited, these assessment results have not been included.

Laryngeal Videostroboscopy.
Videostroboscopic laryngeal imaging was completed with a rigid laryngoscope. Data from the videostroboscopic examination of modal phonation at comfortable pitch and loudness is presented in Table 3.

Trial Therapy/Stimulability Testing.
Trial therapy was conducted. Patient M was stimulable for reduced vocal effort and increased comfort with phonation (per patient report) using simple semi-occluded vocal tract tasks, such as straw in water and sustained /m/. Following these tasks, strain was perceptually reduced in Patient M’s voice.

Medical Examination and Diagnosis.
Patient M was examined by a fellowship-trained laryngologist. The physician diagnosed Patient M with bilateral vocal fold nodules and diffuse vocal fold edema. Patient M was referred for voice therapy.

Table 3. Videostroboscopic findings of Case Study #1

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glottal closure</td>
<td>Hourglass closure</td>
</tr>
<tr>
<td>Amplitude of vibration</td>
<td>Moderately decreased bilaterally</td>
</tr>
<tr>
<td>Mucosal wave</td>
<td>Moderately decreased bilaterally</td>
</tr>
<tr>
<td>Vertical level</td>
<td>WNL</td>
</tr>
<tr>
<td>Adynamic segments</td>
<td>None</td>
</tr>
<tr>
<td>Supraglottic activity</td>
<td>Mild supraglottic hyperfunction in the anterior-posterior and lateral direction</td>
</tr>
<tr>
<td>Free edge contour</td>
<td>Irregular bilaterally</td>
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<tr>
<td>Phase closure</td>
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</tr>
<tr>
<td>Glottal cycle periodicity</td>
<td>Mild aperiodicity (periodic approximately 70-80% of the time)</td>
</tr>
</tbody>
</table>

Developing Goals and a Plan of Care.
Begin by developing a clinical hypothesis regarding the underlying physiological cause of the patient’s voice problem and potential solutions. What appears to be the primary cause of Patient M’s voice problem? Recall her primary complaints and history, her medical diagnosis, perceptual evaluation, and videostroboscopic imaging. Several physiologic problems are evident. Perceptually, Patient M’s voice was strained, posteriorly focused, and she appeared to breath-hold. Videostroboscopy revealed acute and chronic phonotrauma with hour-glass glottal closure, diffuse edema, and reduced mucosal wave. Her medical diagnoses were vocal fold edema and vocal fold nodules, which are problems known to respond to voice therapy (Rosen et al., 2012). Patient M’s primary complaints were increased vocal effort and fatigue, a “raspy” voice, and voice loss.

Considering these impairments, the diagnosis, and the patient’s chief complaints, voice therapy is an appropriate intervention for Patient M. Using Table 1 as a guide, select goals that could be appropriate for this patient. Using Table 2, select therapy tools that could
be used to achieve those goals. Then, review the sample goals, rationales, and suggested interventions below.

**Goal 1:** Improve vocal health and hygiene through strategies such as increased hydration and reduced glottal contact time.

**Rationale:** Patient M’s history was significant for extended voice use in noisy situations, increased daily caffeine consumption, decreased water consumption, and increased alcohol use in combination with extended voice use. Patient M additionally experienced seasonal allergies. These factors suggest vocal hygiene could be an area of improvement for Patient M.

Vocal hygiene will not be a primary goal for all patients with voice disorders and it is typically not sufficient as a singular focus in therapy (Behrman et al., 2008; Carding et al., 1999; Rodriguez-Parra et al., 2011; Roy et al., 2001). However, in cases of severe phonotrauma, improving vocal hygiene can be an essential part of the therapy plan. Poor vocal hygiene can make the vocal folds more susceptible to injury and re-injury, while improved vocal hygiene can help set the stage for vocal fold healing.

One of the primary components of improving vocal hygiene is increasing systemic and/or surface hydration, when appropriate. In Patient M’s case, this is an appropriate strategy due to decreased water consumption and increased caffeine and alcohol consumption. Sufficient hydration of the vocal folds contributes to the overall health of the vocal fold tissues, reduces perceived phonatory effort, decreases subglottal pressure, increases efficiency of vocal fold vibration, and consequently reduces vocal trauma (Alves et al., 2017). Conversely, dehydration has been shown to negatively affect perceptual quality and acoustic parameters of voice, perceived phonatory effort, and subglottal pressure (Alves et al., 2017).

Patient M’s vocal hygiene may also be improved by reducing glottal contact time and force, or reducing vocal demands. This is another strategy that is not necessarily appropriate for all patients. In Patient M’s case, however, she identified specific voice use contexts in which she is prone to losing her voice, indicating that certain vocal environments and types of voice use are phonotraumatic for her. For example, periods of extended voice use in loud situations precede her periods of voice loss. Reducing voice use duration in these situations, particularly in the short term while her vocal folds initially heal, can be beneficial to the overall success of therapy.

**Intervention and therapy tools:** Vocal hygiene is an example of an indirect intervention tool. The clinician can offer strategies to the patient to improve vocal hygiene and help the patient determine ways to incorporate these strategies into daily life. When incorporating vocal hygiene goals into a therapy plan, it is important to include patient education as a therapy tool. In this case, the clinician should be ready to explain the effects of systemic and surface hydration on the vocal folds and describe the benefits of reduced glottal contact time in direct connection to Patient M’s unique situation. Whether vocal hygiene is an integral part of a therapy plan is patient-specific. Likewise, the suggested vocal hygiene strategies should specifically pertain to the individual patient.

**Goal 2:** Utilize semi-occluded postures to promote optimal glottal configurations, allowing for more efficient voicing and reduction of phonotrauma.

**Rationale:** Semi-occluded postures are often used in voice therapy for their positive effects on impedance matching and glottal configuration, which improve vocal economy and distribute collision forces of vibration (Titze, 2006; Titze & Verdolini Abbott, 2012). These tasks are appropriate for someone with vocal fold nodules, as nodules are known to occur in the striking zone of the vocal folds. Reducing mechanical impact in this zone by essentially “squaring up” the vocal folds will decrease phonotrauma. Some research has also shown that semi-occluded tasks can help in the acute stages of wound healing (Verdolini Abbott et al., 2012). This is appropriate for Patient M given her acute vocal fold edema.

**Intervention and therapy tools:** A variety of semi-occluded vocal tract exercises can be used in voice therapy, such as lip and tongue trills, straw phonation in air or water, and sustained nasal
consonants (see table 2). The effects of the semi-occlusion affect the glottal source (vocal folds) differently depending on the location of the occlusion in the vocal tract, size of the occlusion, and overall length of the vocal tract (Smith & Titze, 2017). It is important to select an SOVT task that accomplishes the goal desired at the glottal source and that also works for your patient. When a patient reports that they can feel and/or hear a difference in their voice, and you also perceive a positive change in voice production, you may have found an appropriate SOVT.

**Goal 3:** Increase oral locus of resonance during voice production to increase voicing efficiency and reduce vocal effort and fatigue.

**Rationale:** Patient M’s voice was characterized by epilaryngeal (posteriorly focused) resonance. Using an oral locus of resonance, often described as forward focus or resonant voice, is regarded as a more efficient means of voicing when considering acoustic output compared to collision intensity of the vocal folds and perceived vocal effort (Verdolini, Druker, Palmer, & Samawi, 1998; Berry et al., 2001; Titze, 2004). Patient M uses her voice extensively and often in noisy situations. She expressed that the ability to socialize and talk with others is of the utmost importance to her. This suggests that significantly decreasing her vocal demands long-term to avoid phonotrauma is not a reasonable goal. However, altering the way in which she uses her voice to improve voicing efficiency, while reducing vocal effort and collision intensity of the vocal folds, is a reasonable goal. Increasing Patient M’s oral locus of resonance will allow her to use less vocal effort to achieve a more acoustically powerful sound, resulting in less mechanical trauma to the vocal fold tissues with increased ability to be heard in noise.

**Intervention and therapy tools:** Resonant voice therapy and conversation training therapy are treatment options that can be used to address the above goals. Both interventions focus on increasing oral locus of resonance (through different means) and incorporate the importance of self-monitoring and using the voice with comfortable vocal effort. Additionally, each of these therapies incorporates connected speech and/or conversational stimuli, which is important for our self-reported talkative patient. Selecting the therapy method that is most compatible with the patient will allow the patient to improve vocal health and voice efficiency while allowing them to continue using their voice in important situations.

**Case Study 2: Patient C**

**Case Overview & History of the Problem.**
Patient C, a 73-year-old male business owner, presented to an inter-professional voice center with complaints of a weak voice with decreased volume, difficulty being heard, and increased effort with talking, particularly at the end of a day. Patient C had initially been evaluated by an otolaryngologist as an inpatient status post mitral valve replacement. He noted a significant decrease in vocal quality and volume following surgery, though he reported his voice problems initially began two years prior to surgery, contemporaneous with a diagnosis of Celiac disease and related weight loss. At the time of the initial inpatient otolaryngologist examination, flexible laryngoscopy without videostroboscopy was completed. On referral, Patient C returned one month later as an outpatient to the voice center for a complete voice and videostroboscopic examination with a laryngologist and speech-language pathologist.

**Voice History.**
As a small business owner, Patient C reported considerable ongoing occupational voice demands primarily consisting of meetings and presentations in person or on the phone. Patient C noted that over the past two years, he had been increasingly asked to repeat himself or to speak louder in these contexts. He reported that he used to have a “deep, booming” voice that could be easily heard. Patient C previously coached sports teams and often strained his voice, per his report. He did not have a history of formal voice training or of previous voice problems. He drank 6-7 glasses of water per day and did not have a history of smoking.

**Medical History.**
Patient C’s medical history was significant for Celiac disease and related weight loss, gout, hypertension, and heart disease including mitral valve stenosis (s/p mitral valve replacement), tricuspid regurgitation (s/p tricuspid valve repair), and atrial fibrillation (s/p
placement of cardiac pacemaker). At the time of evaluation, Patient C’s medications primarily included medications for his heart condition (aspirin, Coumadin, digoxin, ramipril, ferrous sulfate, furosemide, metoprolol succinate), as well as allopurinol for gout and montelukast for allergies.

Social History.
Patient C lived in a home with his wife. At the time of his initial otolaryngology evaluation, he was an inpatient. Patient C underwent an additional voice evaluation with videostroboscopy one month later after having returned to his home. He reported a slight reduction in his social interactions since the onset of some health problems 2 years prior to evaluation, though he was still actively running a small business.

Patient Self-Assessment.
Patient C was administered a series of patient-reported outcome measures to better assess the impact of his voice problem. Indices were selected based on apparent clinical utility for Patient C.

- **Voice Handicap Index-10 (VHI-10):** 32/40 (scores greater than 11 indicate impaired voice quality of life) (Rosen et al., 2004; Arffa et al., 2012)
- **Voice Catastrophization Index (VCI):** 26/52 (higher scores indicate greater catastrophization) (Shoffel-Muller et al., 2017)
- **Aging Voice Index:** 60/92 (higher scores indicate greater negative impact on quality of life) (Etter et al., 2018)

Perceptual and Instrumental Evaluation.

**Auditory Perceptual.**
The Consensus Auditory Perceptual Evaluation of Voice (CAPE-V) was administered. The patient received an overall CAPE-V score of 54/100, indicating a dysphonia of a moderate nature. Aberrant perceptual features identified in the voice included consistent roughness (CAPE-V: 50/100), intermittent strain particularly at the ends of phrases (CAPE-V: 41/100), and intermittent breathiness (CAPE-V: 23/100). Pitch of the voice was characterized by overall increased pitch, pitch breaks, and pitch instability (CAPE-V: 48/100). Vocal loudness was consistently reduced in conversation (CAPE-V: 26/100). Resonance was primarily focused in the epilaryngeal region (posteriorly focused). Respiration appeared to be primarily abdominal-thoracic. There was evidence of breath holding in conversational speech.

**Laryngeal Videostroboscopy.**
Videostroboscopic laryngeal imaging was completed with a rigid laryngoscope. Videostroboscopic examination of modal phonation at comfortable pitch and loudness is presented in Table 4.

<table>
<thead>
<tr>
<th>Glottal closure</th>
<th>Spindle-shaped glottal gap with bilateral vocal fold bowing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplitude of vibration</td>
<td>WNL on the right, slightly decreased on the left</td>
</tr>
<tr>
<td>Mucosal wave</td>
<td>Slightly decreased bilaterally, greater on the left anterior fold</td>
</tr>
<tr>
<td>Vertical level</td>
<td>WNL</td>
</tr>
<tr>
<td>Adynamic segments</td>
<td>Adynamic segment on the left anterior vocal fold</td>
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<tr>
<td>Supraglottic activity</td>
<td>Supraglottic hyperfunction in the anterior-posterior and lateral direction</td>
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<td>Glottal cycle periodicity</td>
<td>Mild aperiodicity (periodic approximately 70-80% of the time)</td>
</tr>
</tbody>
</table>

**Trial Therapy/Stimulability Testing.**
Stimulability testing was conducted. Patient C was stimulable for improved vocal quality and pitch stability when asked to use a loud voice.

**Medical Examination and Diagnosis.**
Patient C was diagnosed with bilateral vocal fold atrophy and secondary muscle tension dysphonia by a fellowship-trained laryngologist. Reduced pliability of the vocal folds was observed, consistent with possible vocal fold scarring, most prominent on the anterior left vocal fold.

**Developing Goals and a Plan of Care.**
Begin by developing a clinical hypothesis regarding the underlying physiological cause of the patient’s voice problem and potential solutions. What appears to be
the primary cause of Patient C’s complaints? Several physiologic problems were observed on videostroboscopic examination. First, a spindle-shaped glottal gap with loss of vocal fold volume (vocal fold atrophy/bowing) was observed, likely causing a loss of air during phonation. This physiologic problem could be a primary contributor to the patient’s decreased vocal loudness. Moderate supraglottic hyperfunction was also observed, indicating extra muscle tension and effort, likely related to the patient’s complaint of vocal fatigue and possibly related to reduced vocal loudness. Reduction in the propagation of the mucosal wave indicates decreased pliability of the superficial lamina propria, likely related to roughness in the voice and potentially a further contributor of glottal incompetence (glottal gap). Each of these physiologic problems is contributing to the patient’s dysphonia, but it is important to determine the primary culprit. In order to determine the most salient or consequential problem, work through the case and synthesize information from the patient’s history and exam. The patient is a 73-year-old man with a primary diagnosis of vocal fold atrophy with presbyphonia, or age-related changes to the voice. He also has secondary muscle tension dysphonia. The spindle-shaped glottal gap with vocal fold bowing is a characteristic physiological impairment of vocal fold atrophy. The supraglottic hyperfunction is characteristic of muscle tension dysphonia. In this case, we can deduce that this muscle tension is likely compensation for a primary physiological problem: the glottal incompetence/gap. Supraglottic hyperfunction is often observed in patients with glottal incompetence and is thought to be a compensatory behavior used to bring the vocal folds more closely together to reduce dysphonia.

Recall results of the perceptual evaluation, which included decreased vocal loudness and apparent discoordination of respiration and phonation, including breath holding. Trial therapy revealed that he was stimulable for improved voice quality with loud voice and wishes to regain his “deep, booming” voice, PhoRTE may be a naturally motivating program for Patient C.

Goal 1: Improve respiratory/phonatory coordination, including increasing airflow with voicing and decreasing breath holding in conversational speech, to increase vocal loudness and improve voice quality.

Rationale: Patient C’s primary voice complaint was decreased loudness and trouble being heard by others. Perceptual evaluation indeed revealed decreased loudness as well as evidence of breath holding characterized by strained vocal quality at the ends of phrases. Laryngeal imaging revealed a glottal gap as well as supraglottic hyperfunction. A glottal gap suggests loss of air and can result in decreased ability to efficiently manage air, as reflected in the patient’s compensatory muscle tension and breath holding. These findings indicate discoordination between the respiratory and phonatory systems, which is a physiological impairment that can be addressed in voice therapy (ASHA, n.d.). Addressing coordination between these two systems has the potential to increase vocal loudness, decrease strain, and reduce supraglottic hyperfunction.

Intervention and therapy tools: An exuberant voice therapy program, such as Phonation Resistance Training Exercises (PhoRTE) or Vocal Function Exercises (VFE) can be used to target this goal. Both target respiratory/phonatory coordination. Because the patient was stimulable for improved voice quality with loud voice and wishes to regain his “deep, booming” voice, PhoRTE may be a naturally motivating program for Patient C.

Goal 2: Build vocal endurance and reduce vocal effort and fatigue.

Rationale: Patient C reported having a weak voice that required significant effort to produce, particularly at the end of the day. This could be related to several physiologic deficits observed. First, his voice was characterized by epilaryngeal (or posteriorly focused) resonance, which is known to be less efficient than oral resonance when considering acoustic output compared to collision
intensity of the vocal folds and perceived vocal effort (Berry et al., 2001; Titze, 2004; Verdolini et al., 1998). Second, supraglottic hyperfunction was observed, which suggests Patient C was using significant laryngeal muscle tension when producing voice. This could be contributing to his sense of effort and increasing fatigue throughout the course of a day. By improving vocal endurance and reducing the amount of effort required for making voice, Patient C should be able to use his voice longer and more easily.

**Intervention and therapy tools:** As with goal 1, an exuberant voice therapy program would be appropriate for building vocal endurance. Both PhoRTE and VFE use a programmatic approach to increasing vocal demands, such as increasing phonation time, increasing pitch range, and increasing vocal loudness (PhoRTE only). Gradually increasing Patient C’s vocal demands within a structured program will allow him the opportunity to improve his vocal endurance over time. Exuberant voice therapy programs require consistent, daily practice on the part of the patient, and typically only one program would be used at a time (i.e., one program would be selected for accomplishing both goals 1 and 2).

References

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*A note about Patient C: Though supraglottic hyperfunction was observed, a goal was not specifically created to address this hyperfunction in isolation. Because this muscle tension is thought to be a secondary manifestation of glottal incompetence, initially attempting to reduce the muscle tension could lead to a decrease in voice quality. This would not be an ideal outcome and could result in patient noncompliance, as Patient C's chief complaint was a weak voice with decreased loudness. His increased vocal effort was a secondary complaint. Thus, an attempt was made to address what was believed to be the true physiologic problem. Remember, goals are always considered in the context of the patient. If Patient C's primary complaint had been increased vocal effort or pain with phonation, then a goal more specifically targeted at releasing muscle tension and improving phonatory comfort may have been an appropriate goal to initially incorporate into the plan of care. If, following a course of exuberant voice therapy, Patient C's increased muscle tension were not to subsequently resolve, it could be treated more directly to increase phonatory comfort.*


Interprofessional Education for Concussion Assessment

Elisabeth (Lisa) D’Angelo

Abstract
Concussions are a public health issue due to increased awareness of the long-term effects, and sometimes prolonged recovery in patients (Huber, Alosco, Stein, & McKee, 2016). These long-term effects and recovery issues can impact education, work, and overall quality of life. There are few services available in the community that provide cohesive interdisciplinary assessment and management for patients and their families (Alsalaheen et al. 2016; Weber, Welch, Parsons & McLeod, 2015). Our students in speech-language pathology, physical therapy, nursing and other rehabilitation team members such as physical medicine, occupational therapy, athletic training, and neuropsychology are about to enter the clinical world, and their ability to interact with other disciplines can dramatically improve Interprofessional interaction and communication, as well as patient outcomes (ASHA 2016; Brown et al. 2014; McCrory et al. 2013; Wasserman, Bazarian, Mapstone, Block, & van Wijngaarden (2016); Porter, Constantinidou, & Marron, 2014; Talavage et al. 2014). This interprofessional education (IPE) module was developed to address IPE and interaction in concussion assessment and management (Porter et al., 2014). The specific aim of the study was to assess effectiveness of IPE in concussion assessment.

Learning Objectives
1) Define Interprofessional Education (IPE) goals
2) Identify the main characteristics of prolonged concussion symptoms
3) List the team members involved in concussion assessment

Concussions or Mild Traumatic Brain Injuries (mTBI) are defined as a closed-head injury to the brain induced by mechanical insult (Kelly et al., 1991; Talavage et al., 2014) that does not necessarily result in a loss of consciousness. In 2013, the rate of mTBI for all ages among males was 4.5 per 1000, whereas it was 4 per 1000 among females (Taylor, Bell, Breiding, & Xu, 2017). Mechanisms of injury include sports, recreational activities, falls, abuse, and assaults, and higher incidences are seen in the 0-4 year old range, over 65 and 15-19 years of age (Taylor et al., 2017). Many go unreported and most data is collected by hospital or emergency room visits (Meier et al., 2015). In the past, mTBI was considered a benign injury that you could ‘shake off’, and was described with many colloquial names such as ‘getting your bell rung’ (Nelson, Jane, & Gieck, 1984). Student athletes were encouraged to ‘get back in the game’, and military personnel saw concussions as part of the job, received no education about concussions/mTBI, and were not encouraged to report an mTBI (McCarroll & Zych, 1989). Over the past 30 years, a significant amount of research, and ultimately public awareness stemming from the research, has resulted in revised approaches to prevention, assessment, treatment, and education (Bramley, Patrick, Lehman, & Silvis, 2012; Lew & Chew, 2007; Mac Donald et al., 2015; Silverberg & Iverson, 2013). Though this lens, the education of future clinicians needs to be addressed as well.

Interprofessional Education
Education in health care has evolved in the last twenty years with a recent focus on the IPE approach. IPE is defined as the means by which health and social care professions learn with, from, and about each other to improve collaboration and the quality of care for individuals, family, and communities (Barr, 2002; D’amour & Oandasan, 2005). Simulation experiences are cornerstones of IPE, and their use facilitates interdisciplinary team interaction and learning in a virtual setting (Baker et al., 2008). Future clinicians in
many fields can benefit from this educational approach, especially in relation to assessment and treatment in rehabilitation. IPE allows for interaction, teamwork, understanding and collaboration in the educational process, which in turn enhances communication between all providers, encouraging patient-centered and cohesive care in the field (Brashers et al., 2016; Liaw, Siau, Zhou, & Lau, 2014).

**Evaluation/Assessment of Concussions/Mild TBI**
Mild TBI and TBI rehabilitation in general, is a complex web of professional clinical specialists that are not always connected in one location or network. After a TBI, a patient is usually an inpatient on an acute medical floor at a hospital, then transitions to an acute rehabilitation center, then to home-health services and/or outpatient services (Masel & DeWitt, 2010), and they may or may not transition from service to service with managed care directing the process. With a TBI, there are generally more significant injuries, and increased clarity of the impact on the patient and their family due to overlapping physical, cognitive, emotional and social aspects of the damage. Frequently after a mTBI, with less obvious injuries and symptoms, patients and their families must identify deficits, services needed and providers without any guidance or direction from a professional who understands mTBI.

Symptoms of mTBI include dizziness, headache, vomiting, confusion, visual disturbances, balance issues, memory and attention issues (McCrory et al., 2017). Most people who suffer an mTBI will return to their baseline within 3-4 weeks (Iverson, Brooks, Collins, & Lovell, 2006). However, 15-30% of those who suffered an mTBI will experience prolonged recovery (McCrea et al., 2013). This has been called Persistent Concussion Syndrome, Prolonged Concussion Symptoms, or persistent concussion symptoms, and the incidence and prevalence data is inconsistent (R. L. Zemek, Farion, Sampson, & McGahern, 2013). Persistent mTBI symptoms can affect many aspects of life including ability to learn in school, maintain work responsibilities and manage social interactions. A person who has experienced persistent concussion symptoms has been described as a ‘walking wounded’ or one with ‘invisible wounds’ (Wilk et al., 2010).

The typical approach to evaluating and treating concussions has involved the medical team. This, however, only occurs in the event that the patient with the mTBI is brought to medical attention or seeks it after the injury. As discussed earlier, many mTBI are unreported and not evaluated. Nevertheless, when a person with an mTBI does seek treatment, it usually occurs in an emergency room or with their primary care physician. In most cases, this involves a clinical evaluation, an x-ray or C.T. scan, and if there is no evidence of cerebral bleeding: home to recuperate (Lebrun et al., 2013).

The majority of mTBI symptoms resolve in ten days to three-four weeks, however those with the prolonged or persistent concussion symptoms report ongoing issues: visual disturbances, balance deficits, cognitive deficits (especially attention and memory), emotional concerns, sleep disturbances and a general feeling of not “being themselves” (Corwin et al., 2014; McCrea et al., 2013). Clinical variables that are associated with prolonged recovery and the development of persistent symptoms vary across several studies but may include female sex, younger age, loss of consciousness or post-traumatic amnesia at the time of injury, a previous history of concussion, attention deficit disorder and mood disorders, and initial headache or dizziness at the time of injury (Corwin et al., 2014; McCrory et al., 2017; Zemek et al., 2016). Regardless of the correlations with prior diagnoses or demographic variables, patients with mTBI or prolonged concussion symptoms have needs that can and should be addressed by a cohesive interdisciplinary team. Therefore, our students who will be clinicians in the near future must be educated and trained on their roles, and how to collaborate with their interdisciplinary team effectively.

**Aims and Development of Study**
To address these needs, a team of faculty at California State University, Sacramento, convened in 2017 to develop an IPE program for concussion assessment. The goal was for students in all disciplines to be able to learn together, about each other, and from each other in relation to concussion/mTBI assessment. The faculty that gathered all had extensive clinical and academic professional experience with TBI: a physical therapist, a speech-language pathologist, and a nurse. Development meetings and multiple email exchanges occurred over the course of an eight-month period.
Methods
Design
The design involved a pre-and post-testing with two measures, six pre-readings, and one four-hour seminar with lecture and simulated assessment teams with an evolving case study. IPE guidelines and processes were utilized in the development of all materials and experiences (Hall & Zierler, 2015).

Participants.
Undergraduate and graduate students from all related disciplines in the university were invited to the free course on a weekend day to allow for ease of scheduling. A sample of 66 students participated. The majority of the students were from the Communication Sciences and Disorders Department, with the others including physical therapy, nursing, athletic training/kinesiology, and health science students.

Assessment.
Pre-test and post-test data on concussion/mTBI, assessment of concussion/mTBI, and attitudes toward interprofessional interaction and their experience were collected from students before and after the four-hour seminar. The pre-test/post-test for concussion was a multiple choice ten question assessment relating to concussion symptoms, assessment areas and tools, and interprofessional roles that was created by the faculty from the readings and lectures. The interprofessional assessment pre-/post-test was the Student Perceptions of Interprofessional Clinical Education Second Edition (SPICE R-2) (Zorek et al., 2016). These were the data points used in analysis to identify if there was a significant change in scores and ratings from pre-to post-course assessment in knowledge about concussion/mTBI and attitudes toward other professions in this IPE experience. Data analysis was completed using measures of central tendency and t-test for comparison between pre- and post-assessment results.

Training/Intervention.
A four-hour seminar was created, utilizing pre-reading materials from each discipline. A pre-test based on the readings and the seminar developed by the faculty on concussion/mTBI and a self-report measure on IPE and attitudes toward other disciplines were completed by the students and turned in while entering the course. Pre-reading materials (six total) focused on the role of each discipline with concussion assessment, or team collaboration in concussion assessment. Each faculty member created a discipline-specific PowerPoint lecture, with initial additional slides dedicated to general overview information relating to mTBI. An evolving case study with three separate points in time for a sports-related concussion adolescent virtual patient was also created with multiple variables to consider: symptoms at each point, coach response, parent concerns, and report of virtual patient. Her age, sex and initial emergency room visit information were also presented as part of the evolving case study.

After the faculty team lectures, all students were broken into teams of eight to ten, with each discipline represented: nursing, kinesiology/athletic training, speech-language pathology, physical therapy and health science. The student teams were given the evolving case study and asked to 1) identify current symptoms 2) identify related issues of concern 3) identify assessments that should be completed and 4) make recommendations about next steps in the process. Using large butcher paper and large white boards, each team reviewed and discussed the case and wrote out the symptoms, assessments recommended and follow-up referrals. This process was repeated three times, and each time was presented to the large group. Facilitative questions were generated by the faculty per the IPE and simulation procedures and guidelines (Baker et al., 2008; Hall & Zierler, 2015).

Results
Results from pre- and post-test for concussion and concussion assessment, and the SPICE R-2 were tabulated for all participants. All tests were anonymous; therefore, the results that were obtained were in relation to total group change. All participants were required to submit their pre-tests for entrance to the course, and to complete them at the end, resulting in 100% completion of pre- and post-assessments.
For the concussion and assessment pre- and post-test, the average score for the entire student sample improved from a score of 10.98 (pre) to 12.64 (post) (Figure 1). The test was worth 15 points total. For the SPICE R-2, average survey scale score for the entire student sample increased from 42.33 (pre) to 46.15 (post) (Figure 2). An independent samples t-test was completed on both measures. Results were significantly different from pre- to post-test for the concussion assessment test \( (p<.0001) \) and for the pre- and post-SPICE R-2 \( (p<.0001) \).

Informally, student participants reported positive feelings about the interactions with other team members, the knowledge they acquired, and the overall seminar experience.

**Discussion**

IPE is becoming the academic pedagogical approach of choice, especially in health-care related fields (Bishop, 2016; Decker et al., 2015; Knecht-Sabres et al., 2016; Williams, Lewis, Boyle, Brown, & Holt, 2015). Students benefit in learning together, and from each other, especially in simulation experiences. It has been well-documented that many healthcare errors can be avoided, thereby improving patient outcomes, by improving communication between healthcare providers (Makary & Daniel, 2016; Nemeth, 2017; Vermeir et al., 2015). The possibility of increasing communication between future professionals in the academic period of their career supports the development and consistent implementation of IPE. This interprofessional concussion assessment module was developed to achieve increased understanding and communication, with the hope of building better healthcare teams in the future to address this critical public health issue.

The results of the pre- and post-test on concussion and assessment indicated a significant increase in knowledge and understanding after participation in the IPE event. Prior to the IPE event, students were required to read assigned journal articles chosen by and for each discipline, with some articles providing overlap for team roles, and were prepared/primed for learning in the four-hour seminar. Pre-tests were taken prior to attendance, with the assumption that readings were completed, and they were prepared to interact with the team with basic knowledge of the disorder and the team. PowerPoint lectures were in-depth on concussion: prevalence/incidence, history of assessment and treatment of concussion, mechanisms of injury, neurobiochemical aspects, symptoms, assessment tools, team roles, treatment, recommendations, and post-traumatic growth. With the simulation experience and the team interaction with the evolving virtual case study, all of the information was incorporated and practiced. The interprofessional team experience encouraged synthesis, analysis, discussion, and above all, communication. The results of the post-test indicated significantly improved knowledge of concussion, assessment and team interactions.
interaction in the assessment after their participation in this event.

Results of the SPICE R-2 (Zorek et al., 2016) significantly increased from pre- to post-testing. The SPICE R-2 is an instrument used to rate interprofessional attitudes in students. It is a Likert scale tool that is completed by the student before and after IPE to assess effectiveness and student attitudes and opinions of interprofessional education. Although students were aware of the nature of the module/course, there were no direct teaching or readings associated with IPE itself. This change in scores suggests that the process of IPE, experience and communication, improves student perceptions of other disciplines and team members.

This study demonstrated one form of IPE as it relates to Concussion/mTBI Assessment. As with all preliminary or initial studies, replication is needed to validate these findings. Completing further IPE for Concussion/mTBI, across the many disciplines that work with this disorder and diagnosis will not only inform, but also illuminate potential areas of training, education, and research, with the potential improvement in patient care as the outcome.

Many people experience debilitating prolonged concussion/mTBI symptoms that negatively impact their school, work and social lives. Concussion/mTBI is a significant public health issue, and the public is just now starting to develop awareness of this issue and the needs for prevention, assessment, and treatment. Those in healthcare education are also beginning to focus efforts on educating students about their roles in concussion/mTBI identification, assessment and treatment. The goal of improving outcomes in healthcare has led to adopting IPE approaches in healthcare academic programs at this critical time, providing impetus for identifying new ways to educate our students and prepare them for their future: teamwork and communication. The goal of this study, and the expectation of this IPE, is that those with prolonged symptoms of concussion/mTBI will potentially benefit from this interprofessional team educational approach, encouraging collaboration and communication of these future professionals.

Author Note:
Thank you to all of the rehabilitation team members I have collaborated and worked with in Northern California for the last 29 years, including my interprofessional education team at CSUS. Thank you, also, to all of my hospital patients, school district students, research participants, and university students who inspire me every day.

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References


A Workshop Approach to Improve Graduate Students' Self-Efficacy and Attitude towards Clinical Writing

Whitney Schneider-Cline

Abstract

Purpose: Graduate speech-language pathology students are often expected to successfully complete clinical writing assignments from the onset of their academic experience despite many having limited exposure to and training with this writing genre. The purpose of this study was to develop and evaluate a Clinical Writing Workshop (CWW) tailored to graduate speech-language pathology students.

Method: The CWW provided opportunities for participants to engage in enactive experiences and gain exposure to vicarious influences within the area of clinical writing. As a result, it was hypothesized that participation would result in improved self-efficacy as well as a more positive attitude towards clinical writing. Seventeen Caucasian, female graduate speech-language pathology students at a Midwest university participated in the intervention. The Clinical Writing Self-Efficacy Scale and the Liking Clinical Writing Scale were administered to measure participants’ self-efficacy in the clinical writing domain and identify participants’ attitude towards this writing genre.

Results: Analyses of results indicated that participants demonstrated higher self-efficacy in clinical writing and a more positive attitude towards clinical writing following completion of the intervention.

Conclusion: The results of the study are intended to inform future research in this area and guide the design of clinical writing instruction for graduate speech-language pathology students.

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Financial – Assistant Professor at University of Nebraska at Kearney. Has received grant monies in related to assistive technology in developmental disabilities and identification of Individuals with Brain.

Non-Financial – Has published articles on reflective writing for learning experiences and developing student self-regulation and critical thinking during clinical writing.

Learning Objectives

1) Describe what self-efficacy is in relation to clinical writing

2) Summarize factors that can influence one’s self-efficacy for any given domain (such as clinical writing)

3) Describe key components to a clinical writing workshop aimed to improve graduate SLP students’ clinical writing self-efficacy and related attitude

Clinical writing is an essential skill for speech-language pathologists (SLPs). The quality of SLPs’ clinical writing can impact the assessment, treatment, and reimbursement for any given client, as well as reflect a clinician’s competency. In regards to assessment, a clinician may spend countless hours preparing for and conducting an ideal evaluation for a client, however this work is essentially useless if the results are not presented in a meaningful way (Shipley & MacAfee, 2016). Furthermore, treatment may be impacted based on the goals a clinician writes for a client. Specifically, within the educational setting (although likely not limited to), researchers speculate that the Individualized Education Plan (IEP) goals professionals (such as SLPs) write have an impact on student outcomes (Goodman & Bond, 1993 as cited in Diehm, 2017). Another aspect of clinical writing is the potential impact on reimbursement for services provided. Satterfield and Johnson (2013) provide a glossary of terminology for SLPs to utilize when completing Medicare paperwork to help “minimize mistakes and avoid rejected claims,” (p 24) indicating the critical nature of strong clinical writing skills. In addition, a SLP’s
clinical writing reflects his/her professional credibility, as it is a representation of the individual’s knowledge in the field (Pannbacker, 1975). The importance of clear, professional, accurate and direct clinical writing is evident, however, graduate SLP students often do not receive much formal training in this area (Baxley & Bowers, 1992; Sitler, 1993, as cited in Buhler, Joseph, & Wallenstein, 2006).

The focus of this study was to develop and systematically evaluate a Clinical Writing Workshop (CWW) tailored to graduate speech-language pathology students. Specifically, the study focused on participants’ self-efficacy and attitude towards clinical writing.

Self-Efficacy
Self-efficacy is defined as one’s belief regarding his or her capability to successfully complete specific tasks (Bandura, 1986; 1993). Such beliefs have been identified as significant contributors toward student motivation and achievement (Bandura & Locke, 2003). Those with higher self-efficacy are more motivated to work towards their goals resulting in better outcomes. In addition, beliefs regarding self-efficacy have an impact on engagement and task completion, which explains the connection to motivation and achievement (Klassen, 2002).

Furthermore, self-efficacy influences factors such as task selection, effort exerted, persistence and emotional response (Pajares & Schunk, 2002; Zimmerman, 2000). Students with higher self-efficacy are more likely to work harder, for longer, and handle such situations better emotionally than those with lower self-efficacy for the task at hand (Zimmerman, 2000). As applied to clinical writing, self-efficacy is important. Graduate speech-language pathology students need to be motivated to work diligently on clinical writing tasks in an emotionally sound state in order to be prepared for future professional endeavors.

Direct self-efficacy instruction. Self-efficacy was approached in two ways during the CWW, as both understanding the concept itself and increasing students’ clinical writing self-efficacy are important for success. Student clinicians must understand what self-efficacy is, and the impact it can have on them as well as their clients. Therefore, a specific lesson to generally educate participants about self-efficacy was included in this intervention. It is important for students to understand that self-efficacy is domain specific and how influential self-efficacy can be when considering achievement. They should recognize this, and understand their own self-efficacy for treating certain clients, writing appropriate goals, etc. This awareness will help them make important professional decisions such as identifying when help is needed from other professionals, and when to engage in further research to support their decisions. In addition, students must recognize the importance of self-efficacy for the clients that they treat. In order for clients to transfer skills learned in therapy to outside settings, they must have confidence in their skill level. It is the job of the speech-language pathologist to provide an educational environment that sets the clients up for success, which relies upon factors such as self-efficacy in specific therapeutic tasks. These points were directly addressed within the self-efficacy lesson portion of the CWW.

Factors influencing self-efficacy. Beyond the explicit self-efficacy lesson, the CWW efforts to improve participants’ self-efficacy within this domain were more indirect. The indirect means for improving clinical writing self-efficacy were based on the understanding that an individual’s self-efficacy beliefs are guided by enactive experiences (previous performance), vicarious influences (such as observation of others’ experiences, persuasion from others), and his or her physiological state (Bandura, 1986; Zimmerman, 2000).

Perhaps the most influential source of self-efficacy beliefs comes from enactive experiences in which individuals base their beliefs on previous experience engaged in the task at hand (Zimmerman, 2000). Beginning graduate students likely have limited, minimally successful previous clinical writing experiences. Therefore, gaining successful experience in this area will likely improve their clinical writing self-efficacy. Such opportunities were provided within the CWW. Participants experienced practice focusing on clinical writing skills in a safe, supportive environment. Without the concern of grades and meeting supervisor expectations, participants were able to experience clinical writing in a new way. They were provided with peer and instructor feedback to help improve their writing. With this experience, it was judged that they could become more successful clinical writers, and begin thinking more positively about these experiences, which likely influenced their self-efficacy beliefs for clinical writing.
A second influential source of self-efficacy beliefs comes from vicarious influences (Zimmerman, 2000). In the present design, offering participants opportunities to compare their performance with that of models was designed to provide such influence. This source of comparison increases self-efficacy especially when the model is seen as equal in ability, and when the individual is uncertain about the task or his ability (Bruning, Schraw, Norby, & Ronning, 2004). In consideration of this influence on self-efficacy beliefs, the CWW included peer models as an important feature. As previously discussed, participants had the opportunity to practice clinical writing skills and compare them to the performance of others in the workshop; this vicarious experience was intended to increase the participants’ self-efficacy beliefs.

While vicarious experiences through peer models were intended to increase self-efficacy, the use of expert models can also serve this purpose (Bruning et al., 2004). Peer models reveal the progress made in specific areas and how students’ work improves through participation, and the use of expert models can motivate students to continue working to achieve greater writing as well as inform them about what strong clinical writing entails (Bruning et al., 2004). The use of expert models consisted of strong clinical writing examples (reports, letters, etc.) provided for the participants, as well as instructor models utilized throughout lessons and in critique of student writing attempts. Demonstration of the skills used as well as how the final product is created are essential elements of the clinical writing process that students need to understand and perform.

Another consideration for fostering self-efficacy growth was to ensure the CWW participants obtained accurate interpretation of their beliefs. It is important for students to not only improve their self-efficacy, but to improve their beliefs to an appropriate level. One way to foster accurate self-efficacy beliefs is to provide students with appropriate feedback (Linnenbrink & Pintrich, 2010). By letting students know what specific improvements they have made in areas that need further attention, students will have a better understanding of their abilities. This, in turn, provides them with a more accurate assessment of their self-efficacy. Thus, it was anticipated that such feedback would not only help participants continue to build their skills within the clinical writing domain, but also lead to accurate increases in self-efficacy.

The current study. The significance of self-efficacy on student motivation and achievement is well documented (Bandura & Locke, 2003; Klassen, 2002). Given that self-efficacy beliefs are shaped by enactive experiences, vicarious influences, and one’s physiological state, the design features of the CWW were expected to affect participants’ self-efficacy within this domain (Bandura 1986; Zimmerman, 2000). Participants had the opportunity to engage in clinical writing tasks within an environment where they could prove successful. In addition, peer critiques offered exposure to others’ clinical writing attempts as well as feedback from peers with similar skill level. These experiences were expected to improve participants’ physiological state (e.g., reduce anxiety) while engaged in clinical writing tasks as a result. Therefore, it was hypothesized that participant’s self-efficacy for clinical writing tasks would improve over the course of the CWW.

Because physiological state influences one’s self-efficacy beliefs, and students with greater self-efficacy persevere and demonstrate greater emotional control, participants’ attitudes towards clinical writing were also considered (Bandura 1986; Zimmerman, 2000). It was anticipated that participants, given positive practice opportunities and feedback from peers and an instructor, would demonstrate a more positive attitude towards clinical writing following completion of the CWW.

Method
Participants and Setting
Graduate speech-language pathology students in their second semester at one Midwest university were invited to participate in the CWW. Seventeen, Caucasian female students with a mean age of 24.5 years participated in the study. Participation was voluntary, and consent was required.

Procedures
Participants attended weekly, 50-minute CWW meetings over the course of one semester. Meetings were conducted on campus in a classroom and within a Health Insurance Portability and Accountability Act (HIPAA)-protected computer lab (to insure protection of clients’ identity and personal information). The CWW
was conducted by the author, a certified speech-language pathologist with experience supervising graduate clinicians within a university clinic. The author led all CWW meetings and lessons, provided feedback to participants, and collected all data from the intervention.

**Pre-intervention data collection.** The pre-intervention data was gathered from administration of the Clinical Writing Self-Efficacy Scale (CWSES; see Appendix A) and the Liking Clinical Writing Scale (LCWS; see Table 4 in the Results section). The CWSES was used to indicate how participants felt about their ability to produce clinical writings. The scale was adapted from an existing writing self-efficacy scale (Bruning, Dempsey, Kauffman, McKim, & Zumbrunn, 2013). This measure utilized a 100-point scale in which participants rated their confidence towards specific aspects of clinical writing. Areas such as clinical writing style (e.g., tense, objectivity, mechanics) and content (e.g., relevant information, presentation of assessment results, recommendations) were included. These areas are often the focus of clinical writing assessment in graduate speech-language pathology programs and have been identified as important areas of emphasis for improving clinical writing skills in this population (Packer, 1995; Wilkerson, 2000).

In addition, participants revealed their attitude towards clinical writing through completion of the LCWS. This scale was adapted from Bruning et al. (2013) to indicate how well participants enjoyed clinical writing tasks. This scale involves four brief statements, which participants rated on a 1-5 Likert scale (*strongly disagree* – *strongly agree*) in order to demonstrate their attitude toward clinical writing. The use of the LCWS was intended to reveal changes from pre- to post-intervention and to investigate whether participation in the CWW impacted how participants felt about such writing tasks (*physiological state*).

**Intervention.** Intervention following the collection of all pre-treatment measures consisted of one 50-minute session per week for a 12-week period over the course of one semester. Intervention was presented as a “Clinical Writing Workshop” (CWW) for second semester graduate speech-language pathology students interested in improving their clinical writing skills. The workshop progressed over the course of the semester specifically addressing topics for one or two weeks each. Topics were continually referenced, as applicable, during additional weeks focusing on new topics (see Table 1 for a summary of topics addressed during the CWW).

| Table 1. Clinical Writing Topics Addressed in the Clinical Writing Workshop (CWW) |
| Use of Language | Content |
| Writing in a concise, direct manner | Writing measurable goals |
| Avoiding wordiness | Reporting assessment results |
| Using active vs. passive voice | Writing a summary section |
| Professional word choice | Making recommendations |

Each topic was introduced through explicit instruction from the researcher. The first lesson addressed self-efficacy, as previously explained. Lessons beyond the self-efficacy presentation provided specific information about expectations and guidelines regarding the target clinical writing skill(s). During this instructional phase, information was presented and examples were provided to support lessons. Following the instructional phase, students were provided an opportunity to practice the target skill; this took place during the same meeting as the instructional phase. The participants then had the opportunity to participate in guided critiques of each other’s writings; the critiques were guided in the sense that the researcher provided specific topics for participants to consider and comment on while reviewing another participant’s writing. Following such critiques, the students could make revisions to their writing sample prior to submission. During these revisions, the instructor provided feedback and answered individual participant questions. At the end of each topic, a writing sample was electronically submitted to the researcher. Written feedback was provided for each submitted sample regarding the target skill as well as previously addressed topics; writing samples with instructor feedback were returned prior to the following workshop meeting (in most cases, feedback was provided within 24 hours of the session). This pattern progressed for the course of the semester with each session building from the previous, and each writing sample becoming progressively more critically evaluated based on the increasing criteria.
**Mid- and post-intervention data collection.** Midway through the CWW participants were asked to complete a revision of the CWSES. The Clinical Writing Self-Efficacy Scale-Revised (CWSES-R) was developed as an extension of the original CWSES to include more specific items aligning with the specific goals of this study (see Appendix to notes changes between the pre-intervention CWSES and the mid- and post-intervention CWSES-R). The ten original items from the CWSES remained in order for direct comparisons between pre-, mid-, and post-intervention ratings.

At the conclusion of the twelve-week intervention, participants once again completed the CWSES-R and the LCWS.

**Data analysis.** Once data collection at each phase was complete (pre-, mid-, and post-intervention), data sets were created in IBM SPSS Statistics 21.0 (SPSS) and SAS for each measure (CWSES and LCWS).

The data were entered into SPSS and analyzed using t-tests to determine possible differences between pre-, mid-, and post-intervention data collected. In addition, SAS was utilized to further analyze data to explore relationships between effects of time and participant attendance for measures administered.

**Results**

This study was conducted in order to investigate the effects of graduate speech-language pathology students’ participation in the CWW. It was hypothesized that participants would demonstrate higher self-efficacy in clinical writing and demonstrate more positive attitudes towards clinical writing following this experience.

**CWSES**

The original CWSES, containing ten items and administered at pre-, mid-, and post-intervention, was analyzed separately from the expanded 12 items on the CWSES-R, which was administered only at mid- and post-intervention data collection points. Cronbach’s alpha for the original, ten-item CWSES was .96 (n = 17) at pre-intervention, .96 (n = 10) at mid-intervention, and .98 (n = 14) post-intervention. With Cronbach’s alpha levels greater than the widely accepted minimum of .7, the original CWSES was judged to be reliable (internally consistent) at all three time points (Nunnally & Berstein, 1994).

The means and standard deviations for participants’ CWSES ratings using the original scale are presented in Table 2. To further examine participants’ clinical writing self-efficacy changes, a repeated-measures analysis of variance (ANOVA) was conducted to test the significance of changes in the CWSES ratings for the original scale items. This analysis revealed a significant effect of time, in that the difference in CWSES ratings from pre-intervention ($M = 68.85, SD = 4.85$) to mid-intervention ($M = 79.01, SD = 3.59$), and post-intervention ($M = 85.97, SD = 3.17$) were statistically significant, ($F(2) = 24.42, p < .001$). Furthermore, the repeated-measures ANOVA analyses indicated that the CWSES ratings of original scale items at the three time points each differed significantly from the others. Specifically, mid-intervention CWSES ratings were significantly greater than pre-intervention ratings, and post-intervention ratings were significantly greater than pre- and mid-intervention ratings (see Table 3), consistent with the hypothesis that CWSES ratings would increase over the course of the CWW.

The 12 items included in the CWSES-R were administered in addition to the original 10 items at mid- and post-intervention data collection sessions. As mentioned, the original scale was extended to include more specific items aligning with the goals of this study. Cronbach’s alpha for these expanded, 12 items on the CWSES-R was .96 (n = 10) at mid-intervention, and .97 (n = 14) at post-intervention. This indicates that the CWSES-R items were internally consistent at the given time points.

A paired t-test was conducted to compare the mean differences between the two time points – mid- and post-intervention – when the CWSES-R was administered. This analysis revealed that post-intervention CWSES-R ratings ($M = 87.32, SD = 9.42$) were significantly higher than those completed at the mid-intervention ($M = 80.93, SD = 10.51$) time point ($t(9) = -5.56, p = .001$).

| Table 2. Mean Pre-, Mid-, and Post-Intervention Clinical Writing Self-Efficacy Scale (CWSES) Ratings |
|----------------------------------------|----------------|----------------|----------------|
|                                       | Pre-Intervention | Mid-Intervention | Post-Intervention |
| M (SD)                                | 68.85 (4.85)     | 79.01 (3.59)     | 85.97 (3.17)     |
Table 3. Post Hoc Analysis of Clinical Writing Self-Efficacy Scale (CWSES) Ratings

<table>
<thead>
<tr>
<th>Time</th>
<th>Mean Difference</th>
<th>Standard Error</th>
<th>p</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-10.16*</td>
<td>2.67</td>
<td>.012</td>
<td>[-17.95, -2.36]</td>
</tr>
<tr>
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<td>-17.12*</td>
<td>2.95</td>
<td>.001</td>
<td>[-25.73, -8.51]</td>
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<tr>
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<td>10.16*</td>
<td>2.67</td>
<td>.012</td>
<td>[2.37, 17.95]</td>
</tr>
<tr>
<td>3</td>
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<td>1.56</td>
<td>.005</td>
<td>[-11.52, -2.40]</td>
</tr>
<tr>
<td>2</td>
<td>6.96*</td>
<td>1.56</td>
<td>.005</td>
<td>[2.41, 11.52]</td>
</tr>
</tbody>
</table>

Note. Post hoc analysis of original CWSES ratings at pre-, mid-, and post-intervention. CI = confidence interval. Time 1 = pre-intervention data collection point; Time 2 = mid-intervention data collection point; Time 3 = post-intervention data collection point. * p < .05.

Further investigation of the original CWSES items, as well as the expanded 12 items, was desired to account for the variability in participant attendance. While most participants completed ratings for clinical writing self-efficacy at each data collection time point, few attended consistently (e.g., 7 of the 17 participants attended 5 or more of the 12 sessions conducted). In order to account for attendance with the CWSES ratings, data were entered into SAS and analyzed using multilevel models. This analysis, while similar to repeated-measures ANOVA, allows for the inclusion of missing data (i.e., participants who did not complete the CWSES at all administration times) and greater control of how predictors are entered and considered (e.g., attendance). Findings from these analyses indicated that for the original, 10-item CWSES, time (pre-, mid-, post-intervention) had a significant effect ($F(2) = 31.20$, $p < .001$), while attendance (number of sessions attended) did not ($F(1) = 1.24$, $p = .284$). The interaction between these two predictors, however, was significant ($F(2) = 5.61$, $p = .024$). For the expanded twelve items on the CWSES-R administered at mid- and post-intervention data collection points, a multilevel model revealed that the main effect of time, again, had a significant effect ($F(1) = 29.84$, $p = .000$). The main effect for attendance, however, was not statistically significant ($F(1) = 2.02$, $p = .181$). When the original items and the expanded items were combined for analysis, the multilevel model indicated that the effect of time was significant ($F(1) = 20.16$, $p = .002$), while the effect of attendance was not significant ($F(1) = 2.17$, $p = .167$).

**LCWS**

The LCWS included four statements that participants were asked to respond to using a 1-5 Likert scale (strongly disagree – strongly agree) in order to represent their attitude toward clinical writing (LCWS items are presented in Table 4). The LCWS was administered pre- and post-intervention. At pre-intervention, Cronbach’s alpha for the LCWS was .87 ($n = 17$), and at post-intervention it was .85 ($n = 12$). These calculations indicated acceptable internal consistency for this measure.

The data were entered into SAS for analysis using multilevel models to explore changes in participant ratings over time, account for attendance, and investigate an interaction between the predictors of time and attendance. The main effect of time from pre- to post-intervention ratings was significant ($F(1)=5.96$, $p=.032$), as was the main effect of attendance ($F(1)=5.59$, $p=.029$) for participants attending five sessions. Furthermore, the interaction between time and attendance ($F(1)=8.29$, $p=.014$) was also statistically significant, indicating that participants attending beyond five sessions are predicted to have higher LCWS ratings over time.

**Discussion**

The purpose of this study was to develop an understanding of the impact of the CWW for second semester graduate speech-language pathology students. As one’s self-efficacy is affected by *enactive experiences, vicarious influences*, and *physiological state* (Bandura, 1986; Zimmerman, 2000), the CWW provided opportunities for participants to practice clinical writing in low-stakes tasks, incorporated the use of models (strong and weak), and provided feedback regarding clinical writing performance.
Table 4. Mean Pre- and Post- Intervention Ratings of Liking Clinical Writing Scale (LCWS) Items

<table>
<thead>
<tr>
<th>LCWS Item</th>
<th>Pre-Intervention M (SD)</th>
<th>Post-Intervention M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I enjoy clinical writing</td>
<td>3.12 (1.11)</td>
<td>3.58 (.99)</td>
</tr>
<tr>
<td>I don’t like to write clinical documents*</td>
<td>3.35 (.99)</td>
<td>3.50 (1.00)</td>
</tr>
<tr>
<td>Clinical writing is something I look forward to when working with clients</td>
<td>2.59 (.87)</td>
<td>2.83 (.83)</td>
</tr>
<tr>
<td>I feel poorly when I write clinically*</td>
<td>3.18 (1.07)</td>
<td>4.08 (.67)</td>
</tr>
</tbody>
</table>

Note. *Item was reversely coded; therefore, the positive change in mean ratings indicated that participants liked clinical writing more and felt less poorly when writing clinically at post-intervention data collection point.

It was predicted that CWW participants would demonstrate higher self-efficacy in clinical writing following the increased experience with and exposure to this writing genre. Results of this study support this hypothesis. Participants’ self-efficacy in clinical writing was measured pre-, mid-, and post-intervention using the CWSES. The original CWSES ratings and the CWSES-R ratings were analyzed separately as well as combined. All analyses indicated that ratings were significantly different across data collection time points (i.e., mid-intervention ratings were greater than pre-intervention ratings, and post-intervention ratings were higher than mid-intervention ratings), and that although the effect of time was significant, the effect of attendance was not. The fact that CWSES ratings increased steadily over time suggests that participation in the CWW influenced participants’ clinical writing self-efficacy.

It was also predicted that CWW participants would demonstrate a more positive attitude towards clinical writing following completion of the intervention. Results of this study supported this prediction. Participants’ attitudes towards clinical writing were measured pre- and post-intervention using the LCWS with these data indicating both that ratings from pre- to post-intervention increased significantly and that those who attended more had higher ratings (indicating more positive attitudes towards clinical writing). Participants also demonstrated improved attitudes towards clinical writing following participation, and for those who attended more this change was greater. In addition, the interaction between time and attendance was also significant, indicating that for each session beyond five sessions attended, LCWS ratings increased (i.e., ratings improved the more sessions participants attended).

**Implications**

The findings of this study have implications regarding clinical writing instruction for graduate speech-language pathology students. The CWW approach to clinical writing instruction was successful in facilitating participants’ growth in clinical writing self-efficacy. As previously explained, self-efficacy is related to student motivation and achievement (Bandura & Locke, 2003). With little research-based evidence regarding methods for building clinical writing skills for speech-language pathology students presently exists, graduate programs for speech-language pathologists may wish to consider approaches that include key features of the CWW to facilitate student growth within this writing genre. Specifically, providing students opportunities for practice within this writing genre (*enactive experiences*), exposure to models (*vicarious influences*), and feedback towards their writing performance are elements that merit consideration when developing clinical writing interventions.

*Enactive experiences* were provided through opportunities for clinical writing practice. Writing practice has been shown critical for writing improvement in general and for clinical writing specifically (Hayes, 1996; 2000; Pannbacker, 1975). The CWW provided regular writing practice for participants, which was intended to result in clinical writing
improvement. A key feature of writing practice within the CWW was to provide that practice in a “safe” environment, free of grades and/or any additional stress, punishment, etc. Having the opportunity to practice the act of clinical writing with such freedom presumably gives novice clinical writers opportunities for growth and learning, which could also lead to more positive attitudes towards such writing tasks. The results from this study indicate that graduate programs may want to consider incorporating similar practice opportunities for future SLPs in order to improve clinical writing self-efficacy and promote positive attitudes towards clinical writing.

Vicarious influences were utilized in the CWW through the use of models. Incorporating strong writing models (i.e., writing samples generated by experts in the field demonstrating strong comprehension of appropriate content and form) can be effective for teaching writing skills (Perin, 2007) while the use of weak writing models (i.e., writing samples generated by novices in the field demonstrating limited knowledge of appropriate content and form) can help writers become aware of their errors (Kitsantas, Zimmerman, & Cleary, 2000). Results of this study provide evidence that exposure to both strong and weak models in programs like the CWW can be effective in improving self-efficacy and attitude towards clinical writing. Therefore, inclusion of strong and weak clinical writing models should be considered for clinical writing instruction methods similar to the CWW.

Feedback should also be provided when teaching graduate speech-language pathology students clinical writing skills. In regards to timing, both immediate and delayed feedback can be beneficial (Brinko, 1993; Hattie & Temperley, 2007; Shute, 2008). The CWW utilized both immediate (i.e., “in the moment,” during the CWW session) and delayed (i.e., within 24 hours from the end of the CWW session) forms of feedback to help improve participants’ clinical writing. Feedback source is yet another important consideration; this intervention revealed value in feedback from one’s self, one’s peers (other novices) and the instructor (one with experience with clinical writing). Implications for those teaching graduate speech-language pathology students in the area of clinical writing include the need for careful consideration regarding the timing and source of feedback to be included in clinical writing instruction.

Limitations
While the CWW was generally successful in improving participants’ self-efficacy and attitudes towards clinical writing, this study had limitations. The small (n = 17) sample size limits the generalizability of the findings, as does the fact that all participants were female, Caucasian, graduate students attending the same school in the Midwest. Future research in this area should include larger samples of more diverse participants across geographical locations.

The relationships between some of the participants and the CWW instructor also created further limitations on inferences that can be drawn from the current results. While most of the participants had no academic relationship with the instructor during the semester this study was conducted, a few were directly supervised by the researcher during this semester, and, therefore received a grade for their clinical writing from the researcher during the intervention. In these instances, the instructor’s role potentially influenced participation. The possibility of bias does limit this study and a completely neutral instructor would be ideal for additional research conducted in this area.

Another limitation of the current study was the incomplete attendance participants demonstrated over the course of the CWW. As most participants (n = 10) attended fewer than five sessions, this limited the amount of opportunities for writing practice (enactive experiences), exposure to models (vicarious influences), and feedback provided for these participants. Although the data gathered indicated that participants made gains despite the number of sessions attended, in future studies it would certainly be beneficial for more participants to attend more of the sessions to demonstrate a clearer understanding of the true impact of the CWW.

Furthermore, participants were all enrolled in a clinical practicum at the time of the CWW. They were treating clients, and generating documentation accordingly, which was guided by a clinical supervisor. As such, this feedback and experience may have also contributed to the changes seen over time in the participants’ clinical writing self-efficacy and attitudes towards clinical writing. Future, similar research should consider the use of a control group to provide clear explanation of outcomes measured and account for natural changes in
clinical writing self-efficacy and attitudes for graduate speech-language pathology students.

Finally, a specific limitation in instrumentation was that the CWSES was altered mid-intervention to better reflect areas addressed in the CWW. While this change, generally speaking, was of value as it ultimately generated more relevant data, this mid-intervention adaptation limited the quality of these data. Future research in this area should utilize the CWSES-R or a similar measure throughout the study for more conclusive, complete data.

Conclusion
The current study has both provided important findings and generated additional questions regarding clinical writing instruction and the influence of a structured clinical writing intervention for graduate speech-language pathology students. The CWW has shown itself to be a potentially valuable intervention providing a possible vehicle for graduate student growth in self-regulation and critical thinking (Schneider-Cline, 2017), as well as within the areas of self-efficacy, and attitude towards clinical writing. Student development in these areas was likely supported by the implementation of enactive experiences (e.g., opportunities for writing practice) and vicarious influences (e.g., the use of models). As little research is currently available regarding clinical writing instruction practices, this study contributes to the field in a unique way by offering insights into potentially effective instructional practices. Additional research is needed, however, to provide more comprehensive conclusions regarding ways to help graduate speech-language pathology students become effective clinical writers.

References


Diehm, E. (2017). Writing measurable and academically relevant IEP goals with 80% accuracy over three consecutive trials. Perspectives of the ASHA Special Interest Groups, 2(2), 34-44.


Appendix

Clinical Writing Self-Efficacy Scale-Revised

Students differ in how confident they are about completing various formats and assignments involving clinical writing. In relation to clinical writing, rate how confident that you are that you can do each of the following by indicating a probability of success from 0 (no chance) to 100 (complete certainty). The scale below is for reference only; you do not need to use only the given values. You may assign any number between 0 and 100 as your probability.

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Chance</td>
<td>Very Little Chance</td>
<td>Little Chance</td>
<td>50/50 Chance</td>
<td>Good Chance</td>
<td>Very Good Chance</td>
<td>Complete Certainty</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

_____ I am able to write in a professional, clinical style.**

_____ I am able to write clinical documents in an objective manner.

_____ I am able to avoid the use of first person in my clinical writing.

_____ I am able to write using appropriate mechanics and grammar.

_____ I am able to compose clinical documents using active voice.

_____ I am able to write in a straightforward manner, avoiding ambiguity.

_____ I am able to use appropriate professional vocabulary in my clinical writing.

_____ I can select the essential information that needs to be included in a clinical report.**

_____ I am able to incorporate relevant information regarding my client’s current level of performance.

_____ I am able to present background information in a concise, clear manner.**

_____ I am able to include relevant information regarding the client’s history.

_____ I am able to present assessment results in a professional style.**

_____ I am able to explain formal assessment results well.

_____ I am able to explain informal assessment measures well.
Appendix (continued)

_____ I am able to write appropriate, measurable goals for therapy.**

        _____ I am able to provide thorough rationale for each of my client’s goals.

_____ I am able to construct appropriate recommendations for a client based on clinical findings.**

_____ I am able to synthesize information from multiple sources.**

        _____ I am able to write clinical documents with information presented in a logical, organized manner.

_____ I am able to write a strong lesson plan for my client.**

_____ I am able to independently write a professional diagnostic report.**

_____ I am able to edit and revise my own clinical writing.**

*Note. Items marked ** indicate those included on the original CWSES administered pre-treatment.*
An Early Intervention Classroom-Based Practicum Experience: 
Student Clinician Education in Culturally & Linguistically Diverse 
Naturalistic Environments

Gabriela Simon-Cereijido, Erica Ellis, & Mary Kubalanza

Abstract
Clinical education is essential for students in speech-language pathology programs. A traditional supervisory model is the one-on-one practicum in the university clinic. At California State University, Los Angeles, our clinic provides a full range of diagnostic and therapeutic services to the community. In training our students, we emphasize the importance of holding paramount the well-being of clients and the importance of involving families and caregivers in all aspects of the therapeutic process. However, this model is not conducive to the provision of less traditional services such as group interventions and caregiver training programs. We developed a unique clinical training opportunity by collaborating with a family-centered early intervention program for young children with or at risk for developmental disabilities. This clinical experience helped graduate students gain experience with a culturally and linguistically diverse population. In this paper, we explain the steps, successes, and barriers we encountered during the planning and implementation of this clinical practicum that included early intervention services, parent coaching, and teacher in-service presentations. We also provide recommendations to other faculty and supervisors.

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Learning Objectives
1) Discuss the benefits of a practicum experience in a culturally and linguistically diverse early intervention center for graduate student clinicians, supervisors, teachers, and families
2) Identify the steps needed to set up an early intervention classroom-based practicum for graduate student clinicians
3) List two challenges presented by a classroom-based practicum for graduate student clinicians

Clinical education is essential for students in speech-language pathology programs. In university settings, clinical supervision is a reciprocal process of knowledge and skill transfer between a clinical supervisor and student clinicians aiming to ensure adequate service to clients (O’Connor, 2008). Ultimately, the goal of clinical education is to facilitate professional growth for both supervisees and supervisors while providing high-quality service delivery.

Student clinicians require different levels of input from the supervisor as they increase their skills. They may move from a first stage in which they need substantive feedback to a final stage of self-supervision (Dowling, 2001). A traditional supervisory model is the one-on-one practicum in the university clinic. At California State University, Los Angeles, the Robert L. Douglass Speech-Language Clinic provides a full range of diagnostic and therapeutic services to the community. Clients include adults, preschoolers, and school-age children with a variety of communication disorders currently receiving services, and a waitlist for intervention services of more
than 90 individuals. The goal of our program and clinic is to serve individuals with communication disorders in the most effective and humane manner possible and to ensure that our students commit themselves to this fundamental clinical value. In training our students, we emphasize the importance of holding paramount the well-being of clients as well as their families and caregivers. We also stress the importance of involving families and caregivers in all aspects of the therapeutic process. However, the traditional, “medical,” model is not conducive to the provision of less traditional services such as group interventions and caregiver training programs. Moreover, although new trends in health and educational settings emphasize interprofessional collaboration across disciplines to improve clients’ outcomes and care (Johnson, Prelock, & Apel, 2016), our traditional model does not facilitate collaborations with clients’ teachers or other service providers.

A unique opportunity at an early intervention center
Our campus is the home of a family-centered early intervention program with three classrooms for young children with or at risk for developmental disabilities. The program provides center-based services three times a week for three hours each day. Home visits take place on any of the other two days of the week. Participating children must be accompanied by a caregiver who is expected to participate in classroom activities and attend instructional meetings. Most of the children in the program have active Individual Family Service Plans (IFSPs). Some children receive speech-language services in their homes or at local agencies.

Moreover, this center serves local families from neighboring communities with a large percentage of Latino and Asian-American residents. Many families are multilingual. In Los Angeles County, 57% of the population 5 years and older speak a language other than English at home (U.S. Census, 2015). The majority (69%) speaks Spanish, and of those, 46% reported speaking English less than very well. The second most spoken language is Chinese, including Mandarin, Cantonese, and other Chinese languages. In Los Angeles County, Chinese speakers constitute 7% of the multilingual population, and of those, 60% reported speaking English less than very well (U.S. Census, 2015). In sum, a clinical experience in this early intervention center ensures graduate students gain experience with a culturally and linguistically diverse population.

Clinical supervisors have a practical and ethical responsibility to guide student clinicians to be culturally responsive and respectful. In 2008, the American Speech-Language-Hearing Association’s (ASHA) Strategic Practices Plan identified expanded areas of Professional Practices in Speech-Language Pathology. These areas represent major practice trends that need preservice education and professional development. They include working with multilingual populations, individuals in high poverty areas, and individuals with autism. Transdisciplinary and primary service provider models in early intervention also emerged as expanded areas. In addition, the training of bilingual personnel and issues related to dialect use and code-switching are considered expanded areas of clinical practice. We realized that a collaboration with this early intervention center presented a great opportunity to respond to the contemporary needs of future speech-language pathologists and our graduate students.

We also realized that our program and student body represent an excellent match to the needs of the center. Our students include many first generation, non-traditional students. Non-traditional students include returning students over age 24, career changers, and students of varying cultural and linguistic backgrounds (Blumenstyk, 2018). Moreover, our own expertise in early intervention and bilingual speech-language pathology allows us to guide our students to follow and practice current evidence-based practice (Ellis & Searcy, 2016; Searcy & Ellis, 2017; Simon-Cereijido, 2015, 2018).

Practicum design
In this section, we will describe the steps we took to develop and implement a new clinical experience for our graduate program.

Preparation and needs-assessment
We contacted the program director who invited us to observe the classrooms. The center has three separate classrooms for approximately 12-14 children per classroom. Children attend the program with a caregiver three days per week, Tuesday through Thursday. The large classrooms are set up as early intervention and preschool environments. There are tables for large group and center activities, manipulatives, sensory play, gross motor skills equipment, and an outdoor playground. Each day follows a similar schedule including arrival time, free
play, circle time, activity time, outside time, lunchtime, story time, music movement, and goodbye circle. Caregivers, including mothers, fathers, grandparents, and older siblings, participate in activities and shadow their children. Caregivers also socialize with each other inside and outside the classroom. A master early childhood special education teacher and two teaching assistants run the classroom. At times, graduate students from the Early Childhood Special Education program from California State University, Los Angeles participate in the classroom activities, as this center is one of their placement sites.

We noticed that teachers demonstrate best early intervention practices with the children. For example, teachers and assistants engage with children at eye level, use simple and repetitive language, and play with them at the level demonstrated by the children. Moreover, the majority of the teachers speak Spanish, the most frequent language other than English spoken in the classroom. Although instruction is mostly delivered in English, teachers and assistants use chants and songs in both languages and often accompany verbal routines with a few American Sign Language (ASL) signs. We also noticed that it is difficult to engage parents in some classroom activities and routines. This concern was also voiced by the director of the program and the teachers themselves.

In addition, we were invited to meet the speech-language pathologist (SLP) consultant. The SLP consultant conducts a monthly meeting with parents who participate in the program. We initiated a collaboration by translating meeting materials from English to Spanish and interpreting to Spanish during the meetings. We also shared parent education materials for parents.

Based on the needs assessment and the needs of our graduate clinicians, we proposed a collaboration with this center and designed a unique clinical training opportunity for graduate students to gain experience with the birth-to-three population in a natural context using a push-in service delivery model with culturally and linguistically diverse caregivers and teachers.

**Clinical education curriculum and resources**

We decided that our students would benefit from developing skills in the provision of services based on enhanced milieu teaching (EMT; Hancock & Kaiser, 2002). In addition, students were encouraged to consider the cultural and linguistic diversity of the families and learn about planning and implementing appropriate interventions.

The EMT program was used as a foundational guide to facilitate rich language input and caregiver involvement. It is an evidence-based hybrid approach in which intervention is implemented by the clinician and/or the clinician and caregiver. Clinicians provide direct services and train parents on strategies that promote language development. The EMT framework is widely used in intervention with monolingual English-speaking toddlers with language delay. Speech-language pathologists have been trained to use its ingredients under different names for more than two decades. In its present form, the application of the intervention has been evaluated for individuals with a variety of disabilities, including children with severe cognitive and language delays, and children on the autism spectrum, from various backgrounds (Hancock & Kaiser, 2002; Kaiser & Roberts, 2013). Recently, EMT has been evaluated with Latino children from Spanish-speaking backgrounds (Peredo, Zelaya & Kaiser, 2018).

We used various resources from the literature on Enhanced Milieu Teaching (Hancock & Kaiser, 2002; 2006; Kaiser & Roberts, 2013; Peredo, Zelaya & Kaiser, 2018). The resources provided foundational information and current practices to build our collaboration as well as inform our decisions for the program. For example, using the EMT framework, we determined the topics timeline and modeling and coaching strategies. We also designed implementation checklists and questionnaires based on the EMT literature (Hancock & Kaiser, 2006).

The EMT intervention has three active ingredients: milieu teaching, responsive interaction, and environmental arrangement. Our cultural adaptations included expanding the intervention focus to the extended family-child interactions, beyond the parent-child dyad, as many families attended the center with parents, grandparents, and siblings. We also emphasized taking cultural considerations into account for responsive interactions. Diverse families may show a greater use of directive elicitation techniques, such as commands, that should not be discouraged (Hwa-Froelich & Vigil, 2004; Simon-Cereijido, 2015). Strategies for environmental arrangement were implemented.
using toys and materials from the classroom and daily classroom routines.

**Supervision**

Supervision consisted of two main components. First, a course was created on our digital learning platform (i.e., Moodle) where we built in materials, self-assessments, and schedules for students. Second, an interprofessional approach was used for the weekly supervisory meetings. These group meetings were led by the supervisors and provided opportunities for student clinicians to share successes and challenges they encountered in the classrooms and learn from and with each other.

The learning platform was organized by week. Table 1 includes weekly student clinician assignments, suggested strategies to be introduced by clinicians and the corresponding goals for the parent coaching weeks.

The order of activities follows the EMT model, but students were encouraged to adapt the strategies for their individual clients and families. The alternation between direct service and caretaker coaching was preserved. In the learning platform, we also uploaded EMT readings and other resources, such as adapted reflections from a coaching handbook (Rush & Shelden, 2011).

During supervisory meetings, students reviewed, and were reminded to use, these strategies. In particular, we noticed that it was beneficial to encourage them to set up an interactive context (e.g., playing at the child’s level), utilize responsive interactions (e.g., observing, waiting, and listening), model communication targets (e.g., using age-appropriate language), and incorporate time-delay techniques (e.g., pausing with an expectant look).

<table>
<thead>
<tr>
<th>WEEK</th>
<th>Clinician’s Assignment</th>
<th>Clinician’s Strategies</th>
<th>Parent Goals</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Read the client’s file</td>
<td>Classroom observation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Classroom observation</td>
<td>Review intervention strategies</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Review “Getting to know the child family dreams”</td>
<td>Balanced Clinician-Child Turns</td>
<td>Observation of clinician’s model; Reflection</td>
</tr>
<tr>
<td></td>
<td>Prepare for coaching</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Review Teach-Coach-Review checklist</td>
<td>Coaching and Feedback</td>
<td>Balanced Clinician-Child Turns</td>
</tr>
<tr>
<td>4</td>
<td>Complete the reflection on coaching</td>
<td>Clinician Responsiveness to Child Verbal and Non-verbal Behavior</td>
<td>Observation of clinician’s model; Reflection</td>
</tr>
<tr>
<td>5</td>
<td>Review Teach-Coach-Review checklist</td>
<td>Coaching and Feedback</td>
<td>Parent Responsiveness to Child Verbal and Non-verbal Behavior</td>
</tr>
<tr>
<td>6</td>
<td>Complete the reflection on your parent feedback</td>
<td>Clinician Talk at the Child’s Target Level</td>
<td>Observation of clinician’s model; Reflection</td>
</tr>
<tr>
<td>7</td>
<td>Review Teach-Coach-Review checklist</td>
<td>Coaching and Feedback</td>
<td>Parent Talk at the Child’s Target Level</td>
</tr>
<tr>
<td>8</td>
<td>Review report writing</td>
<td>Clinician Expansions of Child Utterances</td>
<td>Observation of clinician’s model; Reflection</td>
</tr>
<tr>
<td>9</td>
<td>Review Teach-Coach-Review checklist</td>
<td>Coaching and Feedback</td>
<td>Parent Expansions of Child Utterances</td>
</tr>
<tr>
<td>10</td>
<td>Interpret data and observations</td>
<td>Integrating strategies</td>
<td>Integrating strategies</td>
</tr>
</tbody>
</table>
Reflective practice, self-reflection checklists, and assessment of personal belief systems and values were explored during supervision meetings, within the learning platform, and during group meetings to facilitate learning from the supervisors but also from other students. We discussed how to empower caregivers by helping them become their children’s advocates in a culturally competent manner. We also discussed challenges such as poor attendance and unexpected family issues, such as death and loss.

**Selection of families and student clinicians**
Families were selected using input from teachers related to specific criteria including remaining time in the program (children age out at 3 years old), family interest, language(s) used, and equal distribution across the three classrooms. Each client had an IFSP and a service coordinator through the local regional center. Caregivers included both parents and grandparents.

Student clinicians had completed their first year in the Master’s program in speech-language pathology and completed two semesters of practica within the traditional university clinic setting. Six graduate students participated, of which two were bilingual Spanish-English speakers.

**Parent and teacher in-service presentations**
In addition to the regular intervention activities, student clinicians were required to prepare one caregiver presentation and one teacher in-service session. For these two audiences, students created handouts and activities related to the session topics.

Three students prepared a presentation for teachers. They covered typical sound development and a review of strategies to facilitate language development. The presentation took place during a scheduled teacher meeting near the end of the semester. The other three students prepared a presentation for parents and caregivers that was delivered twice, once in English and once in Spanish. They described how to use gestures and signs with young children to facilitate language development. These presentations took place during the regular parent meetings organized by the Director and consulting SLP.

**Collaborative Opportunities**
New trends in healthcare and educational settings emphasize interprofessional collaborations across disciplines to help improve client outcomes and overall care (Johnson, Prelock, & Apel, 2016). To prepare students to engage in effective interprofessional practice, many Communication Disorders programs are designing courses and creating additional opportunities to develop the interprofessional competencies that will support future student success in health and education-related fields. This practicum experience allowed clinicians to gain understanding and practice within the early intervention classroom setting. Student clinicians were able to work with other professionals such as the lead and assistant early intervention teachers, occupational therapists, and the consulting SLP.

Additionally, four out of the six graduate clinicians required interpretation assistance when communicating with Spanish-speaking family members and learned to collaborate with bilingual teachers, teaching assistants, or peers. Student clinicians were also able to get experiences alongside students training from other disciplines such as child development, nursing, special education, and nutrition. These collaborations allowed students to become more aware of the various roles, responsibilities, values, and resources that other experts and SLPs bring to a clinical situation as well as how to navigate when challenges arise between varying approaches and perspectives.

**Student opinions**
Student clinicians completed mid- and post-intervention feedback surveys to help evaluate the program (see Appendix). We evaluated the major themes that emerged across the surveys. In regards to mid-intervention suggestions for supervisors, student clinicians commented on wanting the supervisor to provide additional models and examples of techniques, ideas for adapting to individual needs, and more specific feedback. Student clinicians also commented that supervisors were providing the right amount of support, including opportunities for both reflection and discussion.

Post-intervention feedback from student clinicians described their overall impressions of the clinical experience, challenges, and suggestions for how the
placement could be improved. Students reported that they enjoyed working with the children in a classroom setting and the opportunity to utilize EMT strategies. Following the intervention program, they felt more prepared to work with parents and other caregivers. Graduate clinicians also reported appreciation for the opportunity to work with other professionals (i.e., teachers, occupational therapists, etc.), which was an experience they did not have in our traditional clinical setting. They also reported that it was challenging to establish rapport with the clients’ caregivers and to adapt quickly to the circumstances in a naturalistic classroom setting.

The bilingual graduate clinicians appreciated the challenge to communicate in Spanish and realized the additional preparation and education needed to support the home language. Some clinicians noted the experience could be improved with an additional brief training or recap of the EMT strategies prior to implementation of the intervention, more time allowed for informal assessments prior to treatment, and more examples of how to modify EMT to meet the specific needs of individual clients.

Discussion
This collaboration introduced some challenges, but also demonstrated many areas of success for all involved. The challenges of the program included appropriately pairing student clinicians with families, adequately informing families of the therapy opportunity in advance, ensuring consistent attendance of caregivers throughout the full 10 weeks (which resulted in many absences), as well as facilitating a team approach with other professionals for challenging behaviors of clients. Some families did not have enough information about the program ahead of time to be able to make informed decisions about whether or not they would be able to participate. The lack of information and communication regarding expectations impacted all involved. Caregivers were unaware of the impact an absence would have on a student clinician in need of clinical hours, while clinicians suffered from missed opportunities to gain clinical knowledge and skills if their families were absent. At times, children demonstrated challenging behaviors (hitting, biting, etc.) during their time in the classrooms, and may have benefitted from a more consistent approach by all adults and professionals in the classroom to manage those behaviors.

One of the major strengths of the program was that each group informally reported benefitting from the experience. Specifically, families benefited from individual one-on-one intervention, opportunities to discuss concerns and ask questions, and additional supports as families navigated the early intervention process. Teachers benefited from having additional service-providers in the classrooms as well as an accessible resource for issues related to communication development. Graduate clinicians benefited from working with culturally and linguistically diverse children and families, being part of a push-in experience working with teachers and other professionals (e.g., occupational therapists and physical therapists) as well as the opportunity to be in a birth-to-three setting with a variety of clients. Additionally, the unique experience was successful due to the convenience of location for families, teachers, and student clinicians.

Summary of recommendations to other faculty/supervisors
Other clinical programs, faculty, and supervisors may be interested in developing a similar program for their student clinicians. Below are our overall recommendations:

- Take your time to establish a trusted partnership with the community agency. Learn about the agency’s mission and goals, needs, and opportunities. Collaborating with community agencies that regularly include caregiver attendance or participation creates a unique clinical training opportunity.
- Determine collaborative roles for the agency and your program. Make sure all involved understand expectations.
- Identify families who will both benefit and commit to the program. Prepare a brief description of the benefits for the child and the family and a clear explanation of the needs of graduate clinicians.
- Provide resources to support clinicians’ success, including reading materials, checklists and self-reflection forms, and video clips. Emphasize the need to build rapport with families and support clinicians when presented with novel challenges related to cultural and linguistic diversity (e.g., interpretation needs and translated materials).
Conclusions and future directions

Our newly established clinical training program meets the needs of participants. In the future, we would like to incorporate additional cultural and linguistic considerations into the graduate student clinical training, provide additional training on strategies that could help when working with the caregivers, and improve the selection of participants and the matching between families and graduate students. Students reported challenges in building rapport with caregivers. A more careful matching procedure may ease this initial step in future semesters. Additionally, scheduling an introductory session for families, clinicians, and supervisors at the beginning of the term would provide an opportunity to establish a caregiver-clinician relationship prior to beginning push-in services. Students also reported that the classroom setting required a challenging amount of flexibility from them. Including a brief teacher interview at the start of the term may help familiarize students with classroom dynamics and common factors that warrant modifications so they feel more prepared to adapt to a variety of circumstances. We have continued to work with the Director to maintain and strengthen our collaborative relationship and plan to continue using this unique placement for future graduate clinicians.

References


Appendix

Midterm Feedback Reflection Prompts

1. Write a few sentences to summarize your experience so far. How would you describe this practicum to an incoming graduate student?

2. Write a few sentences to describe how you would like for the remainder of the term to progress. What outcomes do you hope will emerge (for yourself, children, parents, teachers, and/or supervisors)?

3. What is one goal that you can set for yourself in order to support your own success?

4. What is one suggestion for your supervisors to better support your, or your client’s, success?

5. What is one comment/question/concern for the center teachers and staff that may help them achieve positive outcomes?

End of the Semester Feedback Reflection Prompts

1. What did you enjoy most about this practicum experience this summer? How did that feature help you develop as a clinician?

2. What do you feel was the biggest challenge of this practicum experience this summer? How did that feature help you develop as a clinician?

3. How could this clinical placement be improved, either to better serve the clients or to better support student clinicians, in future semesters?
Using Ethics in Evidence-Based Practice: A Clinical Paradigm

Robin L. Edge & Bess Sirmon-Taylor

Abstract

As the awareness of and requirements for evidence-based practice (EBP) increase, there is a justifiable call for the application of EBP into clinical practice. Speech-language pathologists and audiologists in clinical practice, scientists in related research settings, and students in clinical training are required to abide by the American Speech-Language Hearing Association’s Code of Ethics, which mandates members use “evidence-based clinical judgement” (ASHA, 2016, p. 5). This paper proposes that it is a violation of ethical standards to engage in clinical practices that do not have any evidence of efficacy, understanding that there are different levels of evidence. An EBP model and applicable parts of the Code of Ethics will be discussed in addition to the levels of evidence commonly used. Finally, the application of ethics and EBP will be discussed.

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Learning Objectives

1) List the 5 levels of evidence
2) Identify 3 potential ethical implications of evidence-based practice (EBP)
3) Identify the ASHA Code of Ethics rules addressing EBP

Speech-language pathology (SLP) and audiology professionals who serve clinical populations, conduct research, and engage in the supervision of students and other personnel are required to adhere to the principles of ethical conduct as dictated by the American Speech-Language-Hearing Association (ASHA, 2016). One of the primary tenets of ethics involves providing services or engaging in practices that are proven to be efficacious and effective. As the awareness of and requirements for evidence-based practice (EBP) increase, there is a justifiable call for the application of EBP into clinical practice. The Speech-Language Pathologists’ Scope of Practice (ASHA, 2007) calls for the delivery of high quality, evidence-based services, noting that, “services are provided based on applying the best available research evidence, using expert clinical judgments, and considering clients’ individual preferences and values” (p. 5). The Scope describes ethics as the critical underpinning of all clinical practice. The most recent revision of the ASHA Code of Ethics (2016) “...establishes expectations for our scientific and clinical practice based on principles of duty, accountability, fairness, and responsibility” (p. 2), and specifically addresses evidence-based practice, delineating principles and rules which are certainly applicable in spirit and purpose. For example, Principle I, Rule K requires holders of the Certificate of Clinical Competence (CCC) to evaluate the effectiveness of services provided, technology employed, and products dispensed, and they shall provide services or dispense products only when benefit can reasonably be expected (ASHA, 2016). In this context, there is a risk that evidence for therapeutic methodologies may not always rise to the highest level of scientific rigor. This paper defines concepts of ethics and evidence-based practice and we argue that it is a violation of ethical standards to engage in clinical practices that do not have demonstrable evidence of scientific merit.

Ethics is typically defined as a set of principles or guidelines that are based in morality, cultural norms, or acceptable behavior, with a polar dichotomy of what is good or bad, right or wrong (Sirmon-Taylor & Edge,
Interest of those being served” (ASHA, 2016, p. 5).

A code of ethics is a document that outlines the acceptable norms and behavioral expectations within a professional organization. A code will reflect the agreed-upon core values of the group, and is designed to inspire a higher level of critical thinking, decision-making, problem-solving, and collegial engagement in all interactions. Most codes are written in a way that provides an aspirational ambition for those who are held to the outlined standards, providing a mechanism by which members of the organization can make decisions about what is acceptable or unacceptable. ASHA (2016) defines the Code of Ethics as a, “...focused guide for professionals in support of day-to-day decision making related to professional conduct” (p. 2). The ASHA Code of Ethics defines the role of the professional, with obligations and descriptions, serving as the standard to which all speech-language pathologists and audiologists should aspire (ASHA, 2016). Codes of ethics may also include language that addresses sanctions involved for violations of the principles as defined.

The ASHA Code of Ethics has been through a number of iterations across the decades, with the most recent revision published in 2016. The current version includes 4 principles and 55 rules, which provide standards that govern the practice of speech-language pathology, including research and administration in the discipline. The Code serves as a means of educating individuals within the profession, as well as policy makers and consumers of the services provided. A more thorough review of the current ASHA Code of Ethics is provided elsewhere (see Edge, Sirmon-Taylor, & Prezas, 2016).

Principle of Ethics I, Rule M within the Code states that “individuals... shall use independent and evidence-based clinical judgment, keeping paramount the best interests of those being served” (ASHA, 2016, p. 5).

Before addressing what “evidence-based” involves, one must first understand clinical judgment, which has been defined in speech pathology as a clinician’s ability to consider data from all available sources to recommend interventions and treatment outcomes for patients (Records & Weiss, 1993). Treatment outcomes are designed to evaluate the efficacy, effectiveness, and practicability of interventions being used with a patient or student. Although the effectiveness of treatment is a vital part of the clinical process, treatment outcomes should also be evaluated during the initial stages of therapy when the therapist is using treatment procedures and modalities on a trial basis to address patients’ needs. In other words, how does a clinician choose the outcomes he/she targets in therapy? This selection of treatment targets and associated outcomes is a prerequisite step in the EBP method, as treatment outcomes should be hypothesized using patient input with the clinician’s experience, before initiating the first step of intervention. When planning the treatment outcomes for a patient, the therapist should focus on the patient and family’s personal goals, as well as the empirical evidence that a treatment can achieve these goals by using EBP methodology (Sackett, Straus, Richardson, Rosenburg, & Hayes, 2000).

Clinicians might assert that all of their assessment and treatment decisions are evidence-based, and indeed, all treatment assessment and management decisions are evidence-based, when “evidence” is broadly defined (Bothe, 2004). Evidence used in the decision making process for treatment outcomes includes empirical research, textbooks, guidance from a trusted supervisor/teacher or colleague, their own clinical expertise, publicity, information from the web, social media, presentations, and/or testimonials (see Dollaghan, 2007). Although these mechanisms are frequently used by practicing clinicians, only empirical research is considered “evidence” as described in the EBP 5-step model.

EBP, or evidence-based medicine as it was originally known, “is the integration of best research evidence with clinical expertise and patient values” (Sackett et al., 2000, p1). EBP is not a new concept, with its beginnings cited in mid-19th century Paris and ancient Chinese medicine (Sackett et al., 2000). Many authors have used phrases like “evidence-based” or “research-based” in speech-language pathology and audiology and other disciplines (Bothe, 2004). Clinicians may question...
the advantage of EBP when compared to using textbooks, relying on what they learned from professors, or personal experience when making clinical decisions. The EBP methodology allows clinicians to be accountable, ethical, and responsible professionals. Speech-language pathologists and audiologists are accountable to their patients, patient families, their profession, payers, their boss, their coworkers, students in training, and themselves. Reimbursement for services is a complex process and there is significant importance on justifying treatment methods and outcomes for funding and productivity demands. Ethically, ASHA’s Code of Ethics requires that members use EBP, as Principal of Ethics I, Rule A states “Individuals shall use every resource…to ensure that high-quality service is provided” (ASHA, 2016, p4). As clinicians, it is our responsibility to make sound and appropriate treatment decisions that will not reflect negatively on ourselves, our workplace, or our profession. As the Code of Ethics mandates that all ASHA members must use EBP, a discussion of the implementation of EBP is warranted.

ASHA (2005) states that “the term evidence-based practice refers to an approach in which current, high-quality research evidence is integrated with practitioner expertise and client preferences and values into the process of making clinical decisions (p. 1). Critics have argued that EBP uses only research to make clinical decisions (see Bernstein-Ratner, 2006; Cohen, Stavri, & Hersh, 2004), but as noted, ASHA defines EBP as a triad of high-quality research evidence plus patient input and the practitioner’s clinical experience. Just because the EBP methodology only considers research evidence when critically appraising treatment methods, it does not discount the use of clinical experience and patient/family preferences in the decision-making process.

Research Evidence
When reading external scientific evidence, the quality of the research must be scrutinized, or critically appraised, as all research is not created equal. The goal is to find research conducted with high levels of control that demonstrates efficiency and effectiveness, and that is relevant to the individual patient (Bouffard & Reid, 2012). External research evidence has been classified by levels, with lower numbers indicating traditionally stronger research methods than higher numbers, as shown in Table 1. A detailed discussion of the intricacies of the evidence levels can be found elsewhere (see Agency for Healthcare Research and Quality, 2002; Lohr, 2004; Robey, 2004). Levels Ia and Ib are often hard to find in speech-language pathology (e.g., Wood, McIlraith, & Fitton, 2016), as researchers may have a difficult time recruiting enough patients with a specific diagnosis to randomly assign them to groups—a necessary component of a randomized control trial. Although not the “top tier” of research evidence due to fewer controls, clinicians may instead depend on levels Ia to IV as the basis of clinical decisions. EBP practitioners look for research demonstrating the highest level of evidence available to them which can be combine with the patient’s preferences, their clinical experience, and their hypothesized treatment outcomes.

![Table 1. ASHA’s Levels of Evidence](https://www.asha.org/Research/EBP/Assessing-the-Evidence/)

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ia</td>
<td>Well-designed meta-analysis of &gt;1 randomized controlled trial</td>
</tr>
<tr>
<td>Ib</td>
<td>Well-designed randomized controlled study</td>
</tr>
<tr>
<td>IIa</td>
<td>Well-designed controlled study without randomization</td>
</tr>
<tr>
<td>IIb</td>
<td>Well-designed quasi-experimental study</td>
</tr>
<tr>
<td>III</td>
<td>Well-designed non-experimental studies (i.e., correlational and case studies)</td>
</tr>
<tr>
<td>IV</td>
<td>Expert committee report, consensus conference, clinical experience of respected authorities</td>
</tr>
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Clinical Expertise
The second piece of the EBP triad is clinical expertise or expert opinion. Clinical experience is invaluable in the therapeutic process, but should not stagnate as the field evolves (see Bernstein-Ratner, 2006; Kahmi, 2006). In the ASHA Code of Ethics, Principle of Ethics II addresses the responsibility to meet and maintain the requirements for clinical practice, noting, “Individuals shall honor their responsibility to achieve and maintain the highest level of professional competence and performance” (ASHA, 2016, p. 6). Rule A addresses ethical practice with consideration of clinical experience, education, and training.

Patient/Caregiver Perspective
The third mandatory piece of the EBP method is to include the patient and/or caregiver perspectives when making treatment decisions. This is given priority as the
first directive in the Code of Ethics, Principle I, states “Individuals shall honor their responsibility to hold paramount the welfare of the persons they serve professionally” (ASHA, 2016, p. 4). There are a number of strategies that may be used to ensure patient and family perspectives are included in treatment outcome decisions. These include practicing patient-centered care, considering the patient’s and family’s values, priorities, and preferences, and considering the effect of environment and culture on their perspective on health and well-being (ASHA, 2005). As discussed above, all three of these tenets are vital to being a successful evidence-based clinician, though the identification and assessment of research evidence may present a challenge.

Evidence-Based Practice
David Sackett (1997), whom many believe was responsible for popularizing EBP, wrote:

> Without clinical experience, practice risks becoming tyrannized by evidence, because even excellent external evidence may be inapplicable or inappropriate for an individual patient. Without current best external evidence, practice risks becoming rapidly out of date, to the detriment of the patients (p. 3).

EBP is designed to direct clinicians in their search and evaluation of information related to patient care. Additionally, it serves as a guideline for the evaluation process and for searching for additional treatments if the initially chosen treatment was not as effective as expected. According to Sackett and colleagues (2000), EBP involves a 5-step process designed to assist in decision-making so that clinicians will have a framework for ethical and responsible behavior. The process of determining the quality of evidence for implementation in practice is complex and thorough (see Sackett et al., 2000 for an in-depth review of EBP and Yampolsky & Matthies, 2002 for a description and application of the EBP steps in speech-language pathology). A description of the EBP steps, adapted from Sackett et al., (2000) are presented below.

### Step 1
The first step in the EBP model is to develop a patient-specific question. A commonly used method to develop this clinical question is the PICO Framework (Centre for Evidence-Based Medicine, 2017; Hutcheson, 2017). PICO includes the **Patient** or problem in which the clinician describes the patient population similar to the person receiving treatment. For example, “In preschool children who stutter...” defines a group similar to the patient assuming one is working with a child who stutters, five years of age or younger. This wording is specific enough to not receive an overwhelming number of articles during the literature search in step two, but is broader than, “In 5-year-old girls who stutter...” which may not produce a sufficient list of articles to review due to its specificity. The challenge is to find a balance between having a patient or problem that is too broad versus one that is too specific as part of your PICO question.

The **Intervention** and a possible **Comparison** intervention are next. For example, “…how effective is the Lidcombe Program when compared to the GILCU Program...” A comparison intervention does not have to be included, but having two interventions in the question typically makes the literature search more efficient (Greenhalgh, 2014). The final piece of the PICO Framework is the treatment **Outcome** such as, “...leads to lower stuttering frequency.” A generic PICO question is “For a patient like this, what is the best way (or ways) to achieve a certain specific treatment outcome?” Having a clearly defined PICO question is important for efficiency in completing the next steps of the EBP process.

### Step 2
After determining your clinical question, the second step in EBP is to find the current best evidence in an effective and efficient way. The first important component of this step is to identify what type of information is needed to answer your question. There are three categories of research traditionally used, the first of which is quantitative, in which the results are numerical, such as measuring the percentage of syllables stuttered or mean length of utterance. An example of a research study presenting quantitative data is *Stuttering Frequency, Speech Rate, Speech Naturalness, and Speech Effort During the Production of Stuttering* (Davidow, Grossman, & Edge, in press). The second type is qualitative research, which typically reports results as non-numerical (narrative) data. An example of a qualitative research study is *Communication in Young Children With Fragile X Syndrome: A Qualitative Study of Mothers’ Perspectives* (Brady, Skinner, Roberts, & Hennon, 2006). The final type is research presents both numerical and non-

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numerical data and uses both quantitative and qualitative methods. This is known as mixed-methods research and an example is *Quantitative and Qualitative Documentation of Early Literacy Instruction* (Cullata, Kovarsky, Theadore, Franklin, & Timler, 2002).

Once you have determined the type of research that is needed, the final task of step 2 is to search for research using the PICO question. This requires a search for evidence that is balanced with sensitivity and specificity, that yields a sufficient amount of research to evaluate for an informed decision, but not so much research that the clinician must sort through many irrelevant articles. There are numerous databases to search, including PubMed, Web of Science, and Google Scholar. Although some of the search databases are free to access, many articles have to be purchased. ASHA members have free access to ASHA journals, ASHA practice portal and evidence maps as well as other resources at www.asha.org.

**Step 3**
In the third step of the process, the clinician performs a critical appraisal of the evidence found in Step 2 and assesses the validity and usefulness/applicability of the research to their patient. First, while reading article abstracts only, the clinician should ask two questions: (1) is the article peer reviewed? (2) Does the treatment, as described, seem to be feasible for my patient, my work environment, or would it make me change my standard intervention plan? After using these questions to determine if the research is appropriate for the patient and the resources available at the work facility, the final piece of Step 3 is to evaluate the research found. Evaluating or critically appraising research can be accomplished by determining the results of the study and if these are reliable and meaningful. Determining reliability requires the assessment of each study’s design to determine if the research is strong enough to guide clinical decisions. Greenhalgh (2014) and Davidow, Bothe, and Edge-Bramlett (2006) provide assistance in determining the quality of research studies.

**Step 4**
The fourth EBP step is to determine which treatment to implement with a particular emphasis on how relevant the evidence is to the current patient, and discussion with the patient and/or family if they believe this approach will address the hoped-for treatment outcomes. Afterward, the clinician should make an informed clinical decision based on the valid and reliable evidence, its relevance to the patient, personal clinical expertise, and the patient’s preferences. This step is “integrating the critical appraisal with our clinical expertise and with our patient’s unique biology, values, and circumstances” (Straus, Glasziou, Richardson, & Haynes, 2011, p. 3).

**Step 5**
The final step in the EBP method is to implement the treatment chosen in Step 4. This involves evaluating each treatment outcome chosen by collecting strong data on each goal, and completing the 5-step EBP process again if a treatment change is warranted. Step 5 is contingent on the quality of clinical record keeping, for both treatment outcome data and reassessment data throughout the intervention period. New questions may need to be formulated and treatment changed based on the patient’s progress and observations made throughout therapy. If the chosen treatment plan does not result in the desired outcome, the EBP process can be recycled to find an alternative treatment method.

**The Intersection of Ethics and Evidence-Based Practice**
The ASHA Code of Ethics (2016) undergirds all professional practice for speech-language pathologists and audiologists, specifically addressing evidence-based practice by delineating principles and rules which are clearly applicable in spirit and purpose. These principles and rules commit ASHA members and certificate holders to preserve the highest standards of integrity, professional excellence, and honesty while encouraging autonomy and self-regulation (Davidson & Denton, 2010). The Code speaks to the obligations of the scientific, educational, and clinical community in the profession to practice in a manner, “…based on principles of duty, accountability, fairness, and responsibility” (p. 2). Although the Code is inspirational and aspirational in nature, it has stringent ethics enforcement policies (Davidson & Denton, 2010) as it is a credentialing and membership organization. To avoid ASHA sanctions for unethical conduct, it is important for members and certificate holders to abide by all of the Code’s principles and rules including those related to EBP.

The first principle of ethics states that “Individuals shall honor their responsibility to hold paramount the
welfare of persons they serve professionally or who are participants in research and scholarly activities, and they shall treat animals involved in research in a humane manner” (ASHA, 2016, p. 4). The rules within this principle that are relevant to evidence-based practice speak of the need to provide informed consent related to the risks and effects of services and products provided, including accurate representation of the purpose and effectiveness of such services and products (Rules H, J). Services provided, including technology used and products dispensed, can only be implemented when a favorable outcome is projected, but no implicit or explicit guarantee of results can be made (Rules K, L). In order to keep the welfare of the clients, patients, or students served at the center of all decision-making, evidence-based judgment about treatment efficacy is required, with no misrepresentation of the services provided or treatment modalities engaged (Rules M, Q).

The second principle of ethics states, “Individuals shall honor their responsibility to achieve and maintain the highest level of professional competence and performance” (ASHA, 2016, p. 6). The rules that speak to EBP in this principle discuss the requirement for practicing within the scope of professional competence and scope of practice, which is related to the fundamental tenet of EBP regarding the best use of clinician’s clinical judgment (Rule A). EBP provides a structure to investigate treatments to enhance one’s professional competence and assist in broadening one’s personal scope of practice. This competence-based principle also includes a rule requiring individuals in professional practice to use technology in a manner for which it is intended (Rule G).

The third principle of ethics says, “Individuals shall honor their responsibility to the public when advocating for the unmet communication and swallowing needs of the public and shall provide accurate information involving any aspect of the professions” (ASHA, 2016, p. 7). The rules included herein mandate that individuals will not misrepresent their skills or competence, fabricate, dissimulate, or contrive any results or effectiveness of services provided or products used, and require all information to be accurate and complete (Rules A, C, E). Falsification in advertising, promotion of services or products, and in reporting of research is prohibited by the Code and financial disclosures must be accurate and complete (Rules F, G). Further, individuals must avoid potential conflicts of interest that may influence the ability to engage in unbiased and objective clinical decision-making (Rule B).

The fourth and final principle of ethics states, “Individuals shall uphold the dignity and autonomy of the professions, maintain collaborative and harmonious interprofessional and intraprofessional relationships, and accept the professions’ self-imposed standards” (ASHA, 2016, p. 7). In dealing with professional colleagues, ASHA members are required to be truthful in all interactions, with no dishonesty, fraud, or maleficence when discussing clinical outcomes, research findings, and product endorsements (Rules C, E).

**The Application of Ethics and Evidence-Based Practice**

Speech-language pathology has changed over time with the addition of treatment areas not included in the early years of the field. The SLP Scope of Practice has evolved with the addition of dysphagia in the 1980s (Veis & Logemann, 1985), literacy in 2001 (ASHA, 2001), and telepractice within the last two decades. SLPs who completed degrees before the addition of these treatment areas may not have received training in these areas during their graduate program and therefore may need a method to investigate treatment options for patients with swallowing or literacy disorders. EBP provides that method. Over time, seasoned clinicians and researchers have observed waves of innovation in treatment methodology that seemed marginal or questionable when first presented, but were eventually proven to be efficacious and appropriate. EBP provides methodology to support clinicians’ investigation of novel or new methodologies to treat patients. For dysphagia, literacy, and telepractice, a sufficient evidence base was eventually established to demonstrate efficacy of interventions in these areas, and evaluation and treatment modalities are included in the SLP scope of practice and competence. There are examples of interventions for which the evidence did not show positive results over time. For example, facilitated communication is a treatment which made an initially positive impression but never materialized into efficacy, with treatment claims based on anecdotal evidence and unsubstantiated outcomes. The method has fallen out of favor, and although it appears in the literature and clinical practice every few years (typically under a new name), it quickly disappears again because of the lack of scientific evidence to support those
claims, and the potential for harm to patients (ASHA, 2018).

Clinicians and researchers who are in the process of engaging in ethical EBP may use the tools presented here to make decisions about treatment methodologies and outcomes. This includes working through the five steps of EBP as outlined, and a self-examination using the appropriate rules from the Code of Ethics (ASHA, 2016), to determine if the intervention, modality, or methodology under consideration meets the criteria for ethical behavior and practice. If after using the EBP model to search for available research, no treatment studies are found that can be implemented to meet the current need, then a clinician is within ethical boundaries to implement the treatment regime, by applying clinical judgment (tempered by patient and family preferences), based on evidentiary data at hand regarding the effect of the treatment.

**Conclusion**

For practicing clinicians, the ability to access and understand EBP is an ethical responsibility. The ASHA Code of Ethics (2016) clearly speaks to the need to provide services which are efficacious, and it is incumbent on service providers to be good consumers, avoiding unsubstantiated pseudoscience, and seeking evidence-based intervention. Researchers are likewise obligated to generate evidence to support or disprove methodologies, and those providing supervision hold the responsibility for teaching the next generation to engage in ethical and evidence-based practice. Simply stated, professionals must be skeptical of success rate claims that are not supported by acceptable levels of scientific research or evidence. Professionals should also resist adopting treatment approaches that are presented first to the public, especially through mass media, rather than through established scientific channels. In addition, professionals should be wary about trusting their own clinical experience as the sole basis for determining the validity of a treatment claim, and must remember their ethical responsibilities to clients, other professionals, and the public.

On the other hand, new methodologies should not automatically be ruled out, even if there is not sufficient evidence to warrant adoption or establish efficacy within a population. Clinicians must become good end users of the available literature, and make judgment calls about claims that have not yet been substantiated with appropriate evidence. The bottom line is that discussion of efficacy and ethics in EBP should focus on whether a treatment claim is a valid and scientifically-based. Clients, professionals, and the general public are all best served when there is a solid scientific basis to support the discipline and the profession.

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Let’s Talk Trachs

Nathan Thorp

Abstract
Patients with tracheostomies are a medically complex patient population. Many speech-language pathologists do not feel confident working with patients with tracheostomies. A thorough understanding of the relevant anatomy and physiology, as well as the medical conditions that lead to tracheostomy placement is required. Important implications for speech and swallowing are discussed. There are significant benefits of multidisciplinary tracheostomy teams.

Learning Objectives
1) Describe the important anatomical and physiological changes that occur with a tracheostomy
2) State the predicted changes in speech and swallowing function as a result of the tracheostomy
3) Describe the physiology of tracheostomy speaking valves

Patients who have had a tracheotomy are frequently among the most complex patients on a speech-language pathologist’s (SLP) caseload. As the incidence of tracheotomy has increased, more patients with tracheostomies will be on more SLP’s caseloads. The ASHA Position Statement and Guidelines for the Use of Voice Prosthesis in Tracheotomized Persons With or Without Ventilator Dependence (1993) states: “not all speech-language pathologists are equally experienced in the advanced technologies pertinent to these devices during their academic and clinical fellowship year” and recommends “a significant portion of professional training must be conducted in settings that allow the speech-language pathologist to gain appropriate background and experience” (p.18). This statement holds true not just for speaking valves, but also for tracheostomies in general. Surveys have found that only about half of SLP’s feel confident working with patients who have a tracheostomy (Manley, Frank, & Melvin, 1999).

As medical SLP’s, to be competent (and comfortable) practitioners when treating patients with tracheostomies, a thorough understanding of the relevant anatomy and physiology is mandatory. However, we must also be comfortable with the pathophysiology of not just the tracheostomy, but the medical conditions that lead to tracheostomy placement, in addition to being well versed in the implications of the tracheostomy for both speech and swallowing.

Review of Anatomy and Physiology
If we are to treat patients with complex medical conditions—such as most of the conditions that precipitate tracheotomy—it is not enough to simply know the anatomy and physiology of the “vocal tract” and the “swallow mechanism” in isolation, divorced from their context and related systems, as if speech and swallowing were functions performed by a disembodied larynx model like the one we studied in graduate school.

Swallowing and speech are both functions of the aerodigestive tract. The aerodigestive tract is made up of the tongue, lips, teeth, jaw, nose, pharynx and larynx, the cervical esophagus, and the upper trachea that all work together to sustain life through the dual functions of respiration and swallowing. Moreover, as an added bonus, the design of our aerodigestive tract allows for incredibly sophisticated and complex speech production. The aerodigestive tract is responsible for continuously switching between its primary respiratory and swallowing functions, and secondary speech functions (Dikeman et al., 2009). (While speech may be a secondary function biologically speaking, it is usually not secondary in importance to our patients!) These functions are intimately related to one another, and disruptions in one function can impact the other, as can be seen in patients with chronic obstructive pulmonary
disease (COPD), for example, in which the pulmonary
disease also can alter swallowing physiology (Gross,
Atwood, Ross, Olsewski & Eichhron, 2009).

Respiration/Ventilation
Strictly speaking, respiration is the actual exchange of
gasses at the level of the alveoli in the lungs, while
ventilation is movement of the gasses into and out of
the lungs and airways. When we breathe in, the
diaphragm contracts, and the external intercostals lift
and expand the ribcage, which combined enlarges the
thoracic cavity. This draws air in through the nose or
mouth, through the pharynx, larynx, trachea, bronchi,
bronchioles, to the 300 million tiny alveoli where the
gas exchange happens (Seikel, King, & Drumright, 2015).
After the gas exchange, the airflow is reversed, as
diaphragm relaxes and the volume of the thoracic cavity
returns to its baseline—like a deflating balloon—mainly
due to a passive, elastic recoil of the lungs and chest
wall (except when breathing heavily or rapidly, which
engages the muscles of exhalation). The lungs never
completely deflate, due to their pleural “attachment” to
the chest wall, which facilitates re-inflation—again, like
a balloon which is harder to inflate if completely
deflated, but becomes easier once started (Gross et al.,
2012).

Swallowing
The complex interactions of pressure, movement,
sensation, and neurological control that drive successful
swallowing are still being elucidated.

The following is a simplified sequence of key events that
happen as the aerodigestive tract switches from its
respiratory function to its swallowing function and then
back again (Brodsky et al., 2018; Groher & Crary, 2015;
Kendall, McKenzie, Leonard, Gonçalves, & Walker, 2000;
Martin-Harris, Brodsky, Price, Michel, & Walters, 2003).
The bolus is processed in the oral cavity in a complex
dance of lips, cheeks, and tongue to control bolus
positioning for mastication as the bolus is mixed with
saliva and prepared for swallowing. The bolus is moved
posteriorly, the velopharyngeal port closes to valve off
the nasopharynx, the arytenoids tilt forward towards
the epiglottis, the distance between the hyoid and
larynx is shortened, which is followed by the elevation
and excursion of the hyoid (around the time the bolus
leaves the valleculae). The vocal folds adduct, the upper
esophageal sphincter (UES)/pharyngoesophageal
segment (PES) opens, the bolus enters the esophagus,
the PES/UES closes, and the hyoid, larynx, vocal folds,
epiglottis and velum return to resting position.

Importantly, there are three components in airway
protection: mechanical, pressure, and neurological
(Allen, 2013). Mechanical protection is provided by the
physical closure of the airway during the swallow,
accomplished by true vocal fold adduction, vestibular
fold adduction, and epiglottic retroflexion (due to a
combination of hyolaryngeal elevation/excursion and
tongue base movement) and a forward tilt of the
arytenoids (Logemann et al. 1992). Pressure refers both
to the negative pressure that draws the bolus towards
the esophagus, as well as the effect of subglottic
pressure, which is hypothesized to be an important
afferent sensory input (via subglottic mecanoreceptors) that facilitates effective glottic
closure, although the exact nature of its contribution
remains controversial (Gross, Steinshauer, Zajac &
Weissler, 2006; Gross et al., 2012; Jafari, Prince, Kim, &
Paydarfar, 2003; McFarland et al., 2013). Neurological
protection refers to the brainstem driven inhibition of
breathing during swallowing. The coordination of
breathing and swallowing is so “hard-wired” into our
brainstems that it persists even when no longer
necessary, for example, in patients who have had a
laryngectomy (Charbonneau, Lund, & McFarland, 2005).

History of Tracheotomy
The tracheotomy procedure has been performed for
millennia, with evidence of tracheotomies being
performed in Egypt as early as 3600 BC. According to
legend (sometimes attributed to Homer), Alexander the
Great once performed an emergency tracheotomy with
his sword to save the life of one of his soldiers who was
choking on a bone (Golzari et al., 2013; Lasala, 2015;
Szmuk, Ezri, Evron, Roth & Katz, 2008) although the
veracity of this legend has been questioned
(Trubuhovich, 2018). The famous physician Hippocrates
recommended against the procedure due to fears of
injuring the carotid arteries (Golzari et al., 2013).
Indeed, the tracheotomy’s reputation was generally
considered to be unethical into at least the 1800’s, with
texts in the Middle Ages describing it as a “semi-
slaughter” (Szmuk et al., 2008). In 1799, George
Washington, only a few years after his retirement,
contracted epiglottitis, and died a preventable death
due to upper airway obstruction because his physicians
were reluctant to perform such a controversial
procedure on so important a person (Szmuk et al., 2008).

In the mid-1800’s, French physician Armand Trousseau (credited with coining the term aphasia) performed over 200 tracheotomies on children with upper airway obstructions due to diphtheria (Cheng & Fee Jr, 2000; Ezri, Evron, Hadad, & Roth 2005; Szmuk et al., 2008). Mortality was shockingly high (approximately 75%) at the time, but the procedure nevertheless gained some acceptance in severe cases (Durbin, 2005). In the early 1900’s, American laryngologist Chevalier Jackson standardized the procedure and equipment, greatly improving its safety, and it was subsequently used more extensively in the 1930’s during the polio epidemic (Durbin, 2005; Timbrell & Jankowski, 2018). Further advances were made with the introduction of percutaneous techniques in the 1980’s, and now the majority of tracheotomies are performed percutaneously (Timbrell & Jankowski, 2018).

**Indications for Tracheotomy**

What are the indications for having a tracheotomy? Historically, it was almost always due to airway obstruction, often due to diphtheria or other infectious causes (Durbin, 2005). In current practice, however, the majority of tracheotomies are due to need for long term mechanical ventilation (Cheung & Napolitano, 2014).

Indications for tracheotomy (Table 1) fall generally into two categories: Upper airway obstruction, or the need for long term mechanical ventilation or pulmonary toilet (Timbrell & Jankowski, 2018; Cheung & Napolitano, 2014).

<table>
<thead>
<tr>
<th>Indications for tracheotomy</th>
<th>Examples of indications for tracheotomy by category.</th>
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</thead>
<tbody>
<tr>
<td>Upper airway obstruction</td>
<td>Subglottic or tracheal stenosis</td>
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<td>Neoplasm / Tumor</td>
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<td>Bilateral vocal fold paralysis</td>
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<td>Obstructive sleep apnea</td>
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<td>Congenital craniofacial syndromes</td>
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<td></td>
<td>Laryngomalacia or tracheomalacia</td>
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<td>Major head/neck surgery</td>
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<td></td>
<td>Laryngeal trauma</td>
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<td></td>
<td>Craniofacial trauma</td>
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<td></td>
<td>Difficult or failed intubation</td>
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<td></td>
<td>Pharyngeal infection</td>
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<td></td>
<td>Anaphylaxis</td>
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<tr>
<td>Need for long term mechanical ventilation or pulmonary toilet</td>
<td>Degenerative neurological disease</td>
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<td></td>
<td>Congenital neurological disease</td>
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<td></td>
<td>Acute neurological trauma, injury, or disease</td>
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<td>Spinal cord injury</td>
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<td>TBI</td>
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<td>CVA</td>
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<td>Respiratory failure</td>
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<td>Cardiac or pulmonary disease</td>
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<td></td>
<td>Severe critical illness</td>
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<td></td>
<td>Inability to manage secretions</td>
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</tbody>
</table>


**Tracheotomy Techniques**

There are two main techniques for the placement of a tracheotomy. The traditional method is the surgical (or “open”) tracheotomy, which is performed by a surgeon in the OR, and involves a vertical incision into the neck, retraction of the neck muscles, and potentially division of the thyroid gland, followed by an incision into the trachea between the 2nd and 3rd tracheal rings (Walts, Murthy & DeCamp, 2003).

A more recent technique, developed in the 1980’s using a modification of the Seldinger technique (commonly used for placing central lines, among other procedures), is the percutaneous dilational tracheotomy (PDT) which has now overtaken the surgical tracheotomy to become the most common technique used today (Timbrell & Jankowski, 2018). The PDT is performed by making a puncture with a needle between the 2nd and 3rd tracheal rings, a guidewire and catheter are introduced, the needle is withdrawn, and a dilator is then advanced over the guidewire through the soft tissues until the desired diameter is achieved (Byhahn, Wilke, Halbig, Lischke, & Westphal, 2000). The PDT has the advantages...
of being able to be performed in the ICU (often by a critical care physician), rather than in the OR, as well as most studies indicating PDT is superior to surgical tracheotomy in terms of infection rates (Timbrell & Jankowski, 2018).

Equipment
Tracheostomy tubes are available in a variety of configurations from a variety of manufacturers (Walts et al., 2003). Generally speaking, a tracheostomy tube consists of a rigid outer cannula attached to a neck plate or flange (used to secure the tracheostomy tube to the neck) with a smaller, removable inner cannula inserted within the outer cannula. Tracheostomy tubes are available in a variety of diameters and lengths, with some models even featuring adjustable lengths. Depending on the patient’s needs, the curvature of the tracheostomy may begin closer to the flange, or closer to the end of the cannula. Some varieties are also available which have flexible outer cannulas, if the patient’s neck anatomy is not amenable to any of the standard models. Cuffed and uncuffed models are available. Cuffs allow for mechanical ventilation without allowing loss of air around the tracheostomy tube; however, this will preclude phonation using pulmonary air. In a cuffed model, there will be a pilot balloon which is used to inflate or deflate the cuff, as well as monitor cuff inflation status. Overinflated cuffs can lead to pressure necrosis of the tracheal wall, so a manometer should be used when inflating cuffs to avoid overinflating (Hess, 2005).

Tracheostomy models also come in fenestrated and unfenestrated varieties. A fenestration (from the Latin fenestra, meaning “window”) is a small hole on the superior posterior aspect of the cannula (above the cuff, in the case of a cuffed tube). The fenestration allows air to exit towards the upper airway bypassing the tracheostomy, and can help facilitate speech. Fenestrations that are poorly positioned in the airway may increase the risk for formation of granulation tissue, which can lead to bleeding or obstruction of the tracheostomy (Walts et al., 2003).

One-way speaking valves (most famously the Passy-Muir valve, although there are other devices) are devices designed to allow speech production despite the presence of a tracheostomy tube (Shikani, Miller & Elamin, 2015). These devices function by allowing inspiration through the tracheostomy tube, but preventing the air from exiting the tracheostomy tube on expiration, forcing the air around the tube and restoring the normal route of airflow through the larynx, mouth and nose (Morris, Bedon, McIntosh & Whitmer, 2015).

Physiological Implications of Tracheotomy
When a patient undergoes a tracheotomy, there are important changes to the normal anatomy and physiology that we must have a thorough understanding of. In an anatomical sense, the procedure primarily creates a new hole—a tracheostoma—through the anterior neck and anterior tracheal wall—typically between the 2nd and 3rd tracheal rings (Cheung & Napolitano, 2014). Additionally, we must always be cognizant of any anatomical changes that may have necessitated the tracheotomy in the first place—did the patient have an upper airway obstruction due to a neoplasm/tumor, or tracheal stenosis, or a bilateral vocal fold paralysis, or laryngeal trauma? Management will be different in these patients than in those without upper airway obstructions.

In terms of physiology, a tracheostomy disrupts “normal” in several ways, which impacts not only breathing, but swallowing, smelling, tasting, coughing, and phonation (Bailey, 2005; Dikeman, et al., 2009; Suiter, 2014; Terk, Leder, & Burell, 2007). Perhaps most obviously, the primary path of airflow is redirected, bypassing the larynx, pharynx, mouth and/or nose (Dikeman, et al., 2009). Consequences of the diverted airflow include aphonia, the desensitization of the larynx and pharynx (Ding & Logemann, 2005; Feldman, Deal, & Urquhart, 1966), a reduction of subglottic pressure due to the open nature of the tracheostomy (Gross et al., 2003; Gross et al., 2006), and an ineffective cough for clearing laryngeal or pharyngeal secretions (Elpern et al., 2000). Additionally, this diversion of airflow eliminates the benefits of the upper airway for filtration, heat, humidification, and olfaction. This puts patients with a tracheostomy at risk for inadequate airway heat and humidification, which can lead to a less effective mucociliary escalator, impairing mucus clearance (Epstein, 2005; Hedley & Allt-Graham, 1994; Roessler et al. 1988). In patients with chronic tracheostomy dependence, inadequate humidification over time can lead to hyperplasia (overproduction) of goblet cells, leading to increased secretion production; further exacerbating the patient’s impaired secretion management (Roessler et al., 1988). Inadequate management (Roessler et al., 1988).
humidification can be mitigated by the use of external heat and humidification, or the use of heat and moisture exchange filters or HME’s (Hedley & Allt-Graham, 1994).

In addition to the diversion of normal airflow and its consequences, researchers have documented numerous additional disruptions of normal physiology, including: an increase in pharyngeal transit time (Suiter, McCullough, & Powell, 2003), reduced duration or incoordination of vocal fold closure (Shaker et al., 1995), decreased laryngeal elevation (Bonanno, 1971; Dietsch et al., 2017; Ding & Logemann, 2005; Seo et al., 2017), altered laryngeal reflexes (Sasaki et al., 1977), and even compression of the esophagus (Betts, 1965; Schnapf, Favrot, & Dodson, 1993). While the clinical relevance of these findings and the nature of the relationship between tracheostomies and dysphagia have been controversial in the literature, the high incidence of dysphagia in this population is well documented.

**Implications of Tracheotomy for Swallowing**

What are the implications of a tracheotomy for swallowing? We know that certain patient populations are high risk for dysphagia even without tracheostomies, so the patient’s medical history, current medical and functional status, and comorbidities are just as important to consider as the presence of a tracheostomy. Regardless of patient population, there is an abundance of literature associating tracheostomies with dysphagia (Betts, 1965; Bittner & Schmidt, 2015; Bonanno, 1971; Dietsch et al., 2017; Feldman, Deal, & Urquhart, 1966; Gross, Mahlmann, & Grayhack, 2003; Leder, 2002; Seo et al., 2017; Shaker et al., 1995; Suiter, McCullough, & Powell, 2003). The reported incidence of dysphagia in patients with tracheostomies varies considerably across studies, likely due to differences in the respective patient populations studied (patients in a neuro ICU versus a trauma ICU, for example) however, the studies generally agree that the incidence of dysphagia in these patients is high. Published rates of aspiration in patients with tracheostomies are as high as 87%, but again, the range between studies is wide (Bittner & Schmidt, 2015; Ding & Logemann, 2005; Hafner, Neuhuber, Hirtenfelder, Schmedler, & Eckel, 2008; Leder, 2002).

Further complicating the job of the SLP is the fact that a large proportion of the patients who aspirate are likely to do so silently. A large prospective study of nearly 1000 FEES evaluations in ICU patients found that for patients with tracheostomies, the rate of aspiration was over 85%, and aspiration was silent 43% of the time (Hafner et al., 2008). If the patients are still requiring mechanical ventilation, that percentage may be much higher, as a similar prospective study of patients receiving mechanical ventilation via new tracheostomies found the rate of silent aspiration was as high as 82% (Leder, 2002). This higher rate would be consistent with other studies that found silent aspiration was significantly higher in patients with cuffs inflated (Ding & Logemann, 2005).

What about speaking valves? Do speaking valves eliminate or improve aspiration? Results have been mixed, with some studies finding no improvement at all (Donzelli, Brady, Wesling, & Theisen, 2006; Leder, Tarro, & Burrell, 1996; Leder, Ross, Burrell, & Sasaki, 1998; Leder, 1999) and others finding definite improvement (Logemann et al., 1998; Stachler, Hamlet, Choi, & Fleming 1996; Suiter et al., 2003). At the risk of focusing myopically on aspiration, there are other benefits of speaking valves beyond preventing aspiration, such as speech, improved clearance of residue (Ohmae et al., 2006), the restoration of cough, restoration of subglottic air pressure, improved olfaction, or improved secretion management (Ledl & Ullrich, 2017; Lichtman et al., 1995) which may significantly improve our patients’ quality of life.

In summary, while the exact relationship between tracheostomy and dysphagia is still being researched, it appears dysphagia in this population is most likely influenced by the patient’s underlying critical illness and comorbid medical conditions more than by the mere presence of a tracheostomy tube (Francis & Gelbard, 2014; Leder, 2002; Leder & Ross, 2000; Leder et al., 2005; Leder & Ross, 2010).

As clinicians, we should have a high index of suspicion when evaluating swallowing in patients with tracheostomies, and have a very low threshold for proceeding to modified barium swallow study (MBSS) or FEES. Most appropriate patients with tracheostomies should ideally be receiving instrumental evaluations (Suiter, 2014). The timing of evaluations may need to be individualized depending on the patient’s overall medical status (Leder, 2002). This is an opportunity to collaborate with our colleagues from other disciplines to determine the best course of action for our patients.
Additionally, as not all patients will benefit with a speaking valve from a swallowing standpoint, swallowing should be evaluated with and without the speaking valve during MBSS or FEES to determine on a case by case basis if the speaking valve is beneficial (Suiter et al., 2003; Suiter, 2014).

**Implications of Tracheotomy for Communication**
The psychosocial distress caused by an inability to communicate has been well documented (Freeman-Sanderson, Togher, Elkins, & Kenny, 2018; Freeman-Sanderson, Togher, Kenny, Elkins & Phipps, 2016; Khalaila et al., 2011; Tolotti et al., 2018). In studies of ICU survivors, difficulty with communication is a frequent complaint (Hafsteindóttir, 1996; Happ, 2001; Patak, 2006). Don’t underestimate the impact of speech restoration for a patients’ quality of life! Restoring the ability to communicate can improve the patient’s psychosocial well-being, their motivation to participate in rehabilitation, it can give them the ability to meaningfully communicate with loved ones, and to participate in end-of-life decision-making (Magnus & Turkington, 2006). Improving communication can even help prevent medical errors (Bartlett et al., 2008).

Optimizing patients’ abilities to communicate despite the presence of a tracheostomy should be high on our priority lists as SLPs.

The inability to achieve phonation is a side effect of the disruption in normal air flow experienced by patients who have had a tracheostomy. In patients who can tolerate cuff deflation or a cuffless tracheostomy tube, speaking valves are a well-researched option for restoring air flow through the larynx to allow for phonation. Contraindications for the use of speaking valves include: inability to tolerate cuff deflation, tracheostomy model with a foam-filled cuff, excessive secretions, upper airway obstruction (remember to ask why the tracheostomy was placed in the first place!), or patients with abnormal lung mechanics that prevent or complicate exhalation (Hess, 2005). Patients may also be unable to tolerate speaking valves if the size of the tracheostomy tube is too large relative to the size of the patient’s trachea, preventing adequate airflow around the tube on exhalation. Downsizing the tracheostomy tube when possible will help to prevent this. Even when deflated, tracheostomy tube cuffs themselves may still occupy some space in the airway, and can contribute to the same problem of inadequate airflow. Some tracheostomy tubes are have “tight-to-shaft” cuffs, which are designed to lie flat against the outer cannula when deflated. Using a tight-to-shaft model, or switching to a cuffless or fenestrated model may alleviate this problem (Hess, 2005).

Some patients who are unable to tolerate speaking valves may be able to use finger occlusion (Hess, 2005). In my experience, I occasionally encounter patients who may or may not tolerate speaking valves, but who prefer finger occlusion due to its simplicity and lack of additional equipment.

In patients who are unable to tolerate cuff deflation, speaking valves can be used in-line with the ventilator, or novel tracheostomy tube models that are designed to allow speaking with inflated cuffs can be used (Hess, 2005). If unable to use either of the aforementioned options, low- and high-tech AAC options may be investigated (Happ, 2001).

**Multidisciplinary Trach Teams (MDT)**
Trach patients are complex, and there is a lot of variation in practice and management of these patients. Innumerable decisions about how to manage patients with tracheostomies need to be made. When do you transition from endotracheal tube to tracheostomy? What size tracheostomy tube? When do you downsize? Fenestrated or unfenestrated? Cuffed or uncuffed? When do you deflate the cuff? When do you order speech-language pathology evaluations? When do you start speaking valve trials? Inline speaking valve trials or not? When do you start PO trials? Who gets a FEES? When do you decannulate?

Because of this complexity, and because many of these decisions are outside our scope of practice as SLP’s, it is critically important to work closely with our colleagues from other disciplines to give these patients the best care possible. One way to formalize interdisciplinary collaboration is to form a multidisciplinary tracheostomy team. There have been multiple studies published in the last few years which show significant progress in efforts to standardize care across patients and providers, and improve quality of care (Bonvento, Wallace, Lynch, Coe & McGrath, 2017; Cetto et al., 2011; de Mestral et al., 2011; McGrath et al., 2017; Mcgrath & Wallace, 2014; Santos et al., 2018; Speed & Harding, 2013).
Who should be included in a multidisciplinary trach team? Speech-language pathologists, physicians, respiratory therapy, nursing, care coordination, and dieticians should be included. The physician on the team does not necessarily need to lead the team, and can be from ENT, pulmonology/critical care, or surgery, depending on who performs tracheotomies at your institution, or simply whichever service has a physician who is interested and willing to be involved (Bonvento et al., 2017).

Benefits of multidisciplinary trach teams include: Shorter time to SLP evaluation, increased number of SLP referrals, improved and earlier communication, increased use of speaking valves, faster initiation of PO diet, fewer adverse events, reduced ICU and hospital length of stay, faster decannulation, improved staff education, and improved emergency management (Santos et al., 2018; Cameron et al., 2009; McGrath et al., 2017; Speed & Harding, 2013; Mah, Staff, Fisher & Butler, 2017).

One recent example of the benefits of a multidisciplinary tracheostomy team compared pre-MDT and post-MDT outcomes out at Texas Tech Health Science Center, and they found clinically significant differences. ICU length of stay was cut in half from 29 to 14 days, hospital length of stay was reduced from 30 to 22 days, the patients started oral diets on day 6 instead of day 18, they spent 1/3rd less time on the vent, and were decannulated almost a week earlier (Santos et al., 2018). Similar results have been found in the UK and Australia, and by several systematic reviews (Cameron et al., 2009; Mah et al. 2017; McGrath et al. 2017; Speed & Harding, 2013). The benefits of multidisciplinary tracheostomy teams go beyond statistical significance to real, relevant-to-the-patient outcomes, and justify the effort of starting a multidisciplinary tracheostomy team at any facility that treats a significant number of patients with tracheostomies.

Conclusion
Patients with tracheostomies are a medically complex and varied patient population. A thorough understanding of the relevant anatomy and physiology, as well as the numerous medical conditions that lead to tracheostomy placement is critically important. A high index of suspicion for aspiration should be maintained when evaluating swallowing in patients with tracheostomies, and instrumental evaluations should be used frequently. Restoration of communication has numerous benefits, and should be a high rehabilitation priority. Close collaboration with our colleagues from other disciplines—ideally as a critical part of a multidisciplinary tracheostomy team—will increase our patient’s quality of life, and elevate the level of care they receive.

References


Cognitive Rehabilitation Therapy: Implementation with Adults with Traumatic Brain Injury

Jennifer A. Ostergren

Abstract
Traumatic brain injury (TBI) is a significant and global health issue. TBI can result in a variety of long-lasting symptoms, including impairments in the area of cognition. Cognitive rehabilitation therapy (CRT) is a common treatment shown to be effective in addressing cognitive impairments after TBI. Speech-language pathologists (SLPs) play a key role in the provision of CRT for cognitive-communicative disorders following TBI. This article discusses CRT for adults with TBI, including defining CRT, offering a framework for categorizing CRT approaches, and providing several examples of CRT approaches with research evidence to support their use with adults with TBI.

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Financial – Is Associate Dean of the College of Health & Human Services and a tenured Assistant Professor in the Department of Speech-Language Pathology at California State University, Long Beach, CA. Has received royalties for authoring a book on cognitive rehabilitation.

Non-Financial – Has published numerous books and articles as well as presented at the state and national level.

Learning Objectives
1) Define cognitive rehabilitation therapy (CRT) for traumatic brain injury (TBI)
2) List and describe categories of CRT
3) Describe examples of CRT for TBI in the area of attention, memory, and executive function

Traumatic brain injury (TBI) is a significant and global health issue (Center for Disease Control [CDC], 2017). Worldwide, TBI is a major cause of death (especially among young people) and a significant source of lifelong disability (CDC, 2017). Each year, 2.5 million people in the United States sustain a TBI, either as an isolated injury or along with other injuries (CDC, 2017). Every day, 153 people die from injuries related to TBI (CDC, 2017). In the United States, falls are the most prevalent cause of TBI (CDC, 2017), but other common sources include motor vehicle accidents and violence.

TBI is defined as “a disruption in the normal function of the brain that can be caused by a bump, blow, or jolt to the head or a penetrating head injury” (CDC, 2015, p. 15). An explosive blast can also cause a TBI (CDC, 2015). TBI can result when the head suddenly and violently hits an object, or when an object pierces the skull and enters brain tissue (National Institute of Neurologic Disorders and Stroke [NINDS], n.d.). A TBI results in the disruption of normal brain function, evidenced by any of the following clinical signs (Menon, Schwab, Wright & Maas, 2010):

- Any period of loss of or decreased consciousness
- Any loss of memory for events immediately before (retrograde amnesia) or after the injury (post-traumatic amnesia);
- Neurologic deficits such as muscle weakness, loss of balance and coordination, disruption of vision, change in speech and language, or sensory loss;
- Any alternation in mental state at the time of the injury such as confusion, disorientation, slowed thinking, or difficulty with concentration.

TBI can range in severity from mild to severe. After an injury, the characteristics of TBI include one or more of the following (DSM-5; American Psychiatric Association, 2013):

- Changes in levels of consciousness
- Memory disturbances
- Confusion associated with deficits in orientation
- Neurological signs, such as brain injury observable on neuroimaging, new onset or worsening of seizure disorder, visual field deficits, hemiparesis, etc.
A concussion is also a form of TBI, defined as (McCrory, Meeuwisse, Aubry, et al., 2013, p. 1-2):
1. Caused either by a direct blow to the head, face, neck or elsewhere on the body with an ‘impulsive’ force transmitted to the head.
2. Typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously. However, in some cases, symptoms and signs may evolve over a number of minutes to hours.
3. May result in neuropathological changes, but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury and, as such, no abnormality is seen on standard structural neuroimaging studies.
4. Results in a graded set of clinical symptoms that may or may not involve loss of consciousness.

As a result of this close connection to cognitive deficits, communication impairments after TBI are commonly described as **cognitive-communication disorders** (ASHA, 2005, para. 1). Cognitive-communication disorders are further defined as a set of communication features that result from underlying deficits in cognition. Communication difficulties can include issues with hearing, listening, understanding, speaking, reading, writing, conversational interaction and social communication. These disorders may occur as a result of underlying deficits with cognition, that is: attention, orientation, memory, organization, information processing, reasoning, problem solving, executive functions, or self-regulation (College of Audiologists and Speech-Language Pathologists of Ontario, CASLPO, 2015, p. 2).

Individuals with TBI may experience a wide variety of physical, visual, auditory and vestibular, neurobehavioral, swallowing, and communication symptoms (ASHA, n.d.). Communication impairments after TBI are common and enduring in nature (Larkins, 2007). They are often attributed to deficits in the cognitive domains of attention, memory, executive function and/or social cognition following TBI (McDonald, Togher, & Code, 2014; Murdoch, 2010). As a result of this close connection to cognitive deficits, communication impairments after TBI are commonly described as **cognitive-communication disorders** (ASHA, 2005, para. 1). Cognitive-communication disorders are further defined as a set of communication features that result from underlying deficits in cognition. Communication difficulties can include issues with hearing, listening, understanding, speaking, reading, writing, conversational interaction and social communication. These disorders may occur as a result of underlying deficits with cognition, that is: attention, orientation, memory, organization, information processing, reasoning, problem solving, executive functions, or self-regulation (College of Audiologists and Speech-Language Pathologists of Ontario, CASLPO, 2015, p. 2).

Figure 1 represents this intersection of cognition and communication and examples of some common corresponding impacts on communication due to deficits in cognition. Both communication and cognition are at the very core of all daily function and as such are key targets in the rehabilitation process after TBI.

![Figure 1. Cognitive-Communication Disorders and the Intersection of Attention, Executive Function, Memory, and Social Communication](Ostergren (2017, p. 84). Copyright Plural Publishing 2017. All rights reserved. Used with permission.)
One aspect of treatment for cognitive-communication disorders after TBI is cognitive rehabilitation therapy (CRT). CRT has been shown to be effective for adults with TBI (Cicerone et al., 2011, 2005, 2000; Rohling, Faust, Beverly, Demakis, & Rao, 2009). CRT dates back to World War I and the treatment soldiers and civilians received related to war-related TBI. CRT gained momentum in the 1970s and is now a common part of rehabilitative service offered for TBI. Research evidence in this area continues to grow.

Speech-language pathologists (SLPs) play a key role in the provision of CRT following TBI. Services in the area of cognitive-communicative disorders are part of the scope of practice of SLPs (ASHA, 2005). This article will discuss CRT for adults with TBI, including defining CRT, offering a framework for categorizing CRT approaches, and providing several examples of CRT approaches with research evidence to support their use with adults with TBI. Its format is organized around the common cognitive deficits associated with TBI in the areas of attention, memory, and executive function. This article uses as its foundation several meta-analyses conducted by an international panel of experts in cognitive rehabilitation (referred to as the INCOG panel), published in the *Journal of Head Trauma Rehabilitation* in 2104 (Bayley et al., 2014). This important work is supplemented with research evidence published after 2014.

The focus of this article is that of adults with TBI and CRT. Children are a large subset of those who experience TBI and very worthy of discussion, but the research foundations of CRT for adults and children are distinctly different. It is not appropriate to collapse this research or assume that the research evidence that supports CRT with adults generalizes for use with children or vice versa. Lastly, of note, while studies have shown CRT to be effective in the post-acute stages of recovery, CRT is generally not recommended while individuals with TBI are experiencing post-traumatic amnesia (PTA; Ponsford, Janzen et al., 2014). Further, most studies on CRT have been conducted on adults with TBI in the chronic stages of recovery. Research about CRT and its effectiveness in the acute stages of recovery following TBI remains limited.

### Defining CRT

Although there are many definitions of CRT, one commonly utilized definition is that of the Brain Injury Interdisciplinary Special Interest Group (BI-ISIG) of the American Congress of Rehabilitation Medicine (ACRM), which states,

> Cognitive rehabilitation is a systematic, functionally oriented service of therapeutic cognitive activities, based on an assessment and understanding of the person’s brain-behavior deficits. Services are directed to achieve functional changes by (1) reinforcing, strengthening, or reestablishing previously learned patterns of behavior, or (2) establishing new patterns of cognitive activity or compensatory mechanisms for impaired neurological systems (Harley et al., 1992, p. 63; Institute of Medicine [IOM], 2011).

Another definition commonly used in describing CRT is that of the United States Department of Veterans Affairs, which stated that cognitive rehabilitation is:

> One component of a comprehensive brain injury rehabilitation program. It focuses not only on the specific cognitive deficits of the individual with brain injury, but also on [his or her] impact on social, communication, behavior, and academic/vocational performance. Some of the interventions used in cognitive rehabilitation include modeling, guided practice, distributed practice, errorless learning, direct instruction with feedback, paper-and-pencil tasks, communication skills, computer-assisted retraining programs, and use of memory aids (Benedict et al., 2010, as cited in Institute of Medicine, 2011, p. 78).

CRT is provided in either individual or group format (Hammond et al., 2015). In implementing CRT, general treatment recommendations include (Bayley et al., 2014, pp. 302–303):

1. Tailoring treatment to the patient’s neuropsychological profile, premorbid cognitive characteristics, and goals for life activities and participation.
2. Focusing on activities that are meaningful to the patient, in the person’s own environment and applicable to the person’s life
3. Incorporating strategies to generalize
5. Reassessing of on a regular basis using standardized functional outcomes that measure the effectiveness of the intervention you provide.

**Categories of CRT**

Treatment approaches for CRT can be categorized into *restoration, calibration, and/or compensation* CRT (Ostergren, 2017). Each will be described briefly. It is important to note that these are general categories only, offered to provide a framework for understanding CRT. Multiple approaches can be utilized simultaneously. In actual implementation, the distinction between approaches is often blurred and different approaches are used to accomplish a similar goal.

*Restoration CRT* seeks to improve, strengthen, or normalize an impaired cognitive function (IOM, 2011). Restoration CRT often involves repetition, drill, or exercise-like activities that gradually increase in difficulty and demand and are targeted at a specific cognitive process (IOM, 2011). The Society of Cognitive Rehabilitation refers to this type of approach as process training used to “stimulate poorly functioning neurologic pathways in the brain in order to maximize their efficiency and effectiveness . . . using new undamaged pathways (redundant representation) and, sometimes, old particularly damaged pathways” (Malia et al., 2004, p. 32).

*Compensation CRT* provides instruction and training in alternative strategies for completing everyday activities, despite residual cognitive deficits (IOM, 2011). Compensation approaches are divided into internal and external strategy compensation (IOM, 2011; Malia et al., 2004). External strategies use items external to the individual, such as alarms, notebooks, calendars, while internal strategies use internal processes such as mnemonics, visualization, word association (Malia et al., 2004).

*Calibration CRT* targets awareness and self-measurements of cognitive performance and the use of that information to shape behavior after a TBI (Ostergren, 2017). Calibration approaches are common within treatment that focuses on metacognition and the act of ‘thinking about thinking’ to improve performance in daily activities after a TBI (Ostergren, 2017).

**CRT for Attention and Processing Speed**

Impairments in attention (Stierwalt & Murray, 2002) and slowed mental processing (Mathias, Wheaton, & Becker, 2007) are common following TBI. A widely referenced framework for describing attention is that of Sohlberg and Mateer (1987, 2001, 2010), which includes: (a) *focused attention* and the ability to recognize and acknowledge sensory information; (b) *sustained attention* and the ability to maintain attention over time; (c) *selective attention* and the ability to maintain attention in the presence of internal and/or external distraction; (d) *alternating attention* and the ability to shift attention between two or more tasks that require different cognitive demands, and (e) *divided attention* and the ability to respond to two or more events simultaneously (Ostergren, 2017). Some models of attention also suggest this later stage of attention (divided attention) is actually rapidly switching alternating attention. Examples of communication difficulties associated with impaired attention and slowed mental processing following TBI are noted in Table 1.

CRT approaches supported by research evidence for individuals with TBI are Attention Processing Training and Dual Task Training for attention deficits and Time Pressure Management for processing speed deficits (Ponsford, Bayley et al., 2014).

**Attention Processing Training (APT)**

APT was developed in 1987 by Sohlberg and Mateer. There are now three versions available for purchase: APT I, APT II (specifically for mild cognitive impairment), and APT III (computerized version) (Sohlberg & Mateer, 2001a; Sohlberg, Johnson, Paule, Raskin, & Mateer, 2005; Sohlberg & Mateer, 2010). SLPs interested in purchasing the APT can do so at: [https://www.lapublishing.com/](https://www.lapublishing.com/). Historically, APT has been classified as a *restoration* approach, but more recent iterations also incorporate compensation and calibration (Ostergren, 2017). APT can be used to target sustained, selective, alternating, and divided attention, and the executive control of attentional systems.
Table 1. Communication Difficulties Associated with Deficits in Attention and Processing Speed Following TBI

<table>
<thead>
<tr>
<th>Attention</th>
<th>Processing Speed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficulty responding appropriately to incoming information.</td>
<td>Delayed responses.</td>
</tr>
<tr>
<td>Difficulty learning new information.</td>
<td>Difficulty making decisions.</td>
</tr>
<tr>
<td>Difficulty filtering out irrelevant stimuli.</td>
<td>Difficulty comprehending rapid rate of speech.</td>
</tr>
<tr>
<td>Difficulty conversing in situations with distractions, background noise, &amp;</td>
<td>Difficulty staying on topic. Long pauses within discourse.</td>
</tr>
<tr>
<td>multiple participants.</td>
<td></td>
</tr>
<tr>
<td>Difficulty managing the demands of high-level activity.</td>
<td></td>
</tr>
<tr>
<td>Difficulty sustaining attention when reading complex &amp;/or lengthy material.</td>
<td></td>
</tr>
<tr>
<td>Difficulty shifting attention as needed.</td>
<td></td>
</tr>
<tr>
<td>Difficulty maintaining or changing topics in conversation.</td>
<td></td>
</tr>
<tr>
<td>Tangential discourse.</td>
<td></td>
</tr>
<tr>
<td>Social avoidance to compensate for sense of overstimulation.</td>
<td></td>
</tr>
</tbody>
</table>

Tangential discourse.

It uses the following guiding principles (Ostergren, 2017, p. 173):

- Grounding treatment in hierarchical organization and theoretical models of attention
- Providing opportunity for practice and repetition
- Using client data to drive treatment decisions
- Individualizing treatment and promoting generalization to relevant real-world tasks

Dual Task Training (DTT)

DTT targets “dual-tasking,” which is commonly defined as the ability to perform two things at once (Posner & Peterson, 1990). Some authors also refer to dual-tasking as divided attention. DDT is recommended for individuals with a TBI who experience increased difficulty on performing dual-tasks as a part of their injury (Couillet, et al., 2010; Evans, Greenfield, Wilson & Bateman, 2009). DTT combines calibration and restoration CRT (Ostergren, 2017). Restorative aspects include training in attention performance in a hierarchical manner. Calibration aspects include the use of self-reflection, performance feedback, and other instructional tasks to improve awareness (Couillet et al., 2010; Evans et al., 2009).

Current recommendations in the area of DTT suggest that tasks selected closely mirror those in need of improvement in real-world contexts (Ponsford et al., 2014). As such, the first step in DTT is to identify which dual-tasks an individual with TBI is having difficulty with in his/her environment (e.g., answering questions while blowing drying a client’s hair, holding conversation while walking between meetings). After dual-tasks needs are identified and sequenced hierarchically, based on immediacy of need and complexity, DTT begins with practice in the components of a dual-task separately (within a single-function task) (Couillet et al., 2010). Once a sufficient level of accuracy in single-function task performance is obtained, both tasks are combined and targeted within DTT as dual-function task. Treatment focuses on repeated and frequent practice of dual-tasks, both within and outside of treatment session (Evans et al., 2009). DTT also uses metacognitive instruction, through: (a) tasks and instruction that focus the client’s attention on attentional processing during dual-tasks, and (b) guided self-reflection and monitoring of performance accuracy during dual-tasks (Couillet et al., 2010; Weightman & McCulloch, 2014).

Time Pressure Management (TPM)

TPM uses compensation and calibration CRT (Ostergren, 2017). Compensation aspects include instruction in strategies to prevent or reduce time pressures due to slowed mental processing speed (Fasotti et al., 2000; Winkens, Van Heugten, Fasotti, & Wade, 2009). Calibration aspects include targeting awareness of the presence of persisting slowed mental processes after TBI, and its relationship to compensation in daily activities (Ponsford, Bayley et al., 2014, pp. 324–325). Individuals recommended for TPM included individuals with TBI who experience slowed mental processing that impacts daily activities and those who have sufficient awareness to generalize TPM strategies to real-world contexts (Fasotti, Kovacs, Eling, & Brouwer, 2000; Winkens, Van Heugten, & Fasotti, 2009; Winkens, Van Heugten, Wade, & Fasotti, 2009).
TPM seeks to provide strategies to reorganize the execution of tasks so individuals with TBI “give themselves enough time to deal with the task at hand” (Fasotti, Kovacs, Eling, & Brouwer, 2000, p. 48). This includes both preventative and management strategies (Winkens, Van Heugten, Wade, Habets & Fasotti, 2009), such as additional planning prior to task completion, reorganizing task steps, rehearsing a task in advance of performance, and modifying the environment prior to or during task completion. TPM incorporates training in the strategy of *Let Me Give Myself Enough Time* (Fasotti et al., 2000, p. 52), which is broken down into four parts: analyze, prevent, emergency plan, and implement/monitor (Figure 2). Training begins with tasks and education to identify the need for strategies to address slowed mental processing (Ostergren & Crandall, 2017a).

This is followed by instruction in the use of the *Let Me Give Myself Enough Time* strategy, first with support and then in independent use in novel settings and activities (Ostergren & Crandall, 2017a).

**CRT for Memory**

Memory impairments after a TBI are common (Velikonja et al., 2014; Wilson, 2009). They present generally as difficulty in encoding, storing, and retrieving new information, which has a negative impact on new learning and daily tasks (Sander & van Veldhoven, 2014; Velikonja et al., 2014).

Prospective memory deficits are also common following TBI and negatively impact memory for carrying out actions (also known as ‘remembering to remember’) (Mateer, Sohlberg & Crinean, 1987; Roche, Fleming, & Shum, 2002). After TBI, declarative memory (memory for what we know about things) is also often more greatly impacted than non-declarative/procedural memory (memory for how to perform tasks) (Bhatnagar, Iaccarino & Zafonte, 2016). Examples of difficulty in communication associated with impaired memory following TBI are noted in Table 2.

There are many sources that describe the use of instructional practices to enhance learning for those with memory impairments following TBI. These include the principles of distributed practice, effortful processing of information/stimuli, and teaching strategies that constrain errors, such as errorless learning and spaced retrieval (Velikonja et al., 2014). In the area of CRT, research evidence supports predominantly *compensation* CRT, both internal and external, for memory deficits following TBI (Velikonja et al., 2014).

<table>
<thead>
<tr>
<th>Table 2. Communication Impairments Associated with Deficits in Memory Following TBI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Memory</strong></td>
</tr>
<tr>
<td>• Difficulty recalling instructions or messages.</td>
</tr>
<tr>
<td>• Difficulty learning new information.</td>
</tr>
<tr>
<td>• Difficulty recalling details when reading complex and/or lengthy material.</td>
</tr>
<tr>
<td>• Difficulty maintaining topic or remembering purpose of conversation.</td>
</tr>
<tr>
<td>• Repetition of ideas, statements, questions, conversations, or stories.</td>
</tr>
<tr>
<td>• Failure to use compensatory strategies to improve performance on everyday tasks.</td>
</tr>
</tbody>
</table>

This is particularly true for those with mild and moderate memory impairments. For individuals with severe memory impairments after TBI, environmental supports are recommended (Velikonja et al., 2014). Some researchers have also suggested the importance of including metacognitive techniques (calibration CRT) to improve metamemory in individuals with TBI (Kennedy, 2006). *Restoration* CRT is not recommended for memory impairments after TBI.
Table 3. Examples of External and Internal Memory Compensation

<table>
<thead>
<tr>
<th>External Memory Compensation</th>
<th>Internal Memory Compensation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sticky Notes/Note Pad</td>
<td>Visual Association: Mentally linking someone’s name or a target word to be recalled to a connected image</td>
</tr>
<tr>
<td>Voice Recorder</td>
<td>Mnenomics: Using the first-letter or first word of information to be remembered in order to create a word or short phrase to aid in recall.</td>
</tr>
<tr>
<td>Pagers</td>
<td>Rehearsal/Organization: Using techniques that organize and rehearse information to aid in recall, such as clustering information together for recall or remembering it in the context of a narrative.</td>
</tr>
<tr>
<td>Timer and Alarms</td>
<td></td>
</tr>
<tr>
<td>Calendars and Planner</td>
<td></td>
</tr>
<tr>
<td>Object Locators</td>
<td></td>
</tr>
<tr>
<td>Photographic Phone/Contact List</td>
<td></td>
</tr>
<tr>
<td>Medication Management Devices</td>
<td></td>
</tr>
<tr>
<td>Global Positioning Systems (GPS)</td>
<td></td>
</tr>
</tbody>
</table>

Source: Ostergren & Crandall (2017b)

Guidelines relative to restorative approaches for memory recommend it “only be considered to develop adjunct memory rehabilitation strategies with evidence-based instructional and compensatory strategies, and only if developed in conjunction with a clinician with a focus on strategy development and transfer to functional tasks” (Velikonja et al., 2014, p. 382).

Table 3 contains a few examples of internal and external memory compensation techniques. Internal memory compensation is generally recommended for individuals with mild and moderate memory impairments, who have executive function sufficient to generalize internal strategies to real-world tasks (Velikonja et al., 2014). External memory compensation is generally recommended for individuals with all levels of memory impairment (mild, moderate, or severe), who have sufficient awareness to generalize strategies to real-world tasks, with or without environmental support (Velikonja et al., 2014).

For both external and internal compensation, memory compensation CRT proceeds similarly (Ostergren & Crandall, 2017b; Schmitter-Edgecombe, Fahy, Whelan, & Long, 1995; Sohlberg and Mateer, 1989). Generally, the first step in this process is to select the applicable compensatory strategy, based on client need/desire and careful assessment. This is then followed by teaching and instruction in the use and purpose of that strategy. The application of this strategy is then practiced in a controlled environment, guided closely by the clinician. Finally, the strategy in practiced in natural and novel circumstances.

CRT for Executive Function

Executive function deficits after TBI are common and have a lasting impact on functional and psychosocial outcomes (Spitz, Ponsford, Rudski & Maller, 2012; Hanks, Rapport, Millis & Deshpande, 1999). There are varying ways to conceptualize executive function. Sohlberg and Mateer (2001) offer a helpful description of the core aspects of executive function, which include:

a) *initiation/drive* and the ability to start or ‘activate’ behavior in response to a need, information, or internal intention(s),
b) *response inhibition* and the ability to stop (inhibit) related behaviors not relevant to task performance,
c) *task persistence* and the ability to maintain attention through task completion,
d) *organization* and the ability to unify and sequence task actions and thoughts,
e) *generative thinking* and the ability to generate novel ideas and solutions during task completion, and
f) *awareness* and the ability to successfully modify actions for successful task completion.

Examples of difficulty in communication associated with impaired executive function following TBI are noted in Table 4.

Three approaches with established research evidence in the area of executive function deficits after TBI are: Goal Management Training, Strategic Memory and Reasoning Training, and Constructive Feedback Awareness Training (Tate et al., 2014). TPM (as above) is also often discussed in the area of executive function.
Table 4. Communication Impairments Associated with Deficits in Executive Function Following TBI

<table>
<thead>
<tr>
<th>Executive Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lack of coherence in discourse.</td>
</tr>
<tr>
<td>• Lack of organization in planning daily activities.</td>
</tr>
<tr>
<td>• Difficulty implementing plans and actions.</td>
</tr>
<tr>
<td>• Difficulty initiating conversations.</td>
</tr>
<tr>
<td>• Problems recognizing and repairing conversational breakdowns.</td>
</tr>
<tr>
<td>• Inability to determine the needs of communication partners.</td>
</tr>
<tr>
<td>• Difficulty making inferences or drawing conclusions.</td>
</tr>
<tr>
<td>• Difficulty assuming another person’s perspective.</td>
</tr>
<tr>
<td>• Difficulty interpreting the behavior of others.</td>
</tr>
<tr>
<td>• Difficulty evaluating validity of information.</td>
</tr>
<tr>
<td>• Verbose; lack of conciseness in verbal expression.</td>
</tr>
<tr>
<td>• Decreased comprehension of abstract language, humor, and/or indirect requests.</td>
</tr>
<tr>
<td>• Difficulty meeting timelines.</td>
</tr>
<tr>
<td>• Difficulty formulating realistic goals.</td>
</tr>
<tr>
<td>• Difficulty recognizing complexity of tasks and need for simplification.</td>
</tr>
<tr>
<td>• Difficulty anticipating consequences of actions.</td>
</tr>
<tr>
<td>• Inappropriate comments</td>
</tr>
</tbody>
</table>


Goal Management Training (GMT)
GMT uses calibration and compensation CRT (Ostergren, 2017). GMT is recommended for individuals with deficits in executive function (Grant, Ponsford, & Bennett, 2012; Levine et al., 2000; Levine et al., 2011; Waid-Ebbs et al., 2014). Researchers recommend pre-implementation assessment to confirm deficits in the area of executive function and to assess the ability of the individual in “holding goals in mind, subgoal analysis, and monitoring” (Levine et al., 2000, p. 301-302). GMT is based on the theory that sustained attention is a key aspect of executive function. Hence, lapses in sustained attention (also known as slips of intention) are believed to impair executive function and task performance (Stuss & Alexander, 2007; Stuss & Levine, 2002). GMT instructs individuals to monitor performance, identify these slips in intention, and implement strategies to reduce their impact on executive function (Stuss & Alexander, 2007; Stuss & Levine, 2002). This is accomplished through instruction in the steps represented in Figure 3: stop, define, list, learn, and check (Levine, Robertson, Clare, et al., 2000). First, GMT targets acquisition of this process, followed by mastery/generalization of it real-world contexts, and finally, the use and monitoring of this process over time without clinician support (maintenance) (Ostergren, 2017).

Strategic Memory and Reasoning Training (SMART)
SMART uses calibration CRT to improve impairments in gist reasoning that lead to difficulties in executive function (Ostergren, 2017). SMART researchers define gist as “the ability to synthesize complex information, whether written, auditorily presented, or visually depicted, into abstracted meanings that are not explicitly stated” (Chapman, 1995, as cited in Vas, Spence, & Chapman, 2015). The key features of SMART are instruction in strategies to: 1) filter incoming and discard irrelevant information, 2) integrate and combine important facts within incoming information, and 3) process incoming information from different perspectives that lead to cognitive flexibility and innovative thinking (Ostergren, 2017; Vas et al., 2011). Individuals recommended for SMART are those with moderate-to-significant difficulties accomplishing complex tasks involving “flexible and innovative thinking, and problem solving” (Vas et al., 2016, p. 504). SMART is also recommended for those with sufficient information processing capacity to complete SMART tasks that generally involve reading and processing of lengthy information.

SMART can be implemented individually or in groups. SMART utilizes the three phases of: strategic attention, integrated reasoning, and innovation/cognitive flexibility (Cook, Chapman, Elliott, Evenson & Vinton, 2014; Vas et al., 2016). Each phase is generally accomplished through reading information and processing it using specific strategies. In the strategic attention phase, training focuses on strategies to
identify and discard irrelevant information (filter). Within the integrated reasoning phase, training continues with strategies to focus and combine information by similar ideas (focus/chunk) and to connect that information to personal experience and world knowledge (link). Lastly, in the innovation/cognitive flexibility phase training continues to with strategies to evaluate information from different perspectives, including describing the larger picture (zooming out), providing details for a narrow perspective (zooming in), and expanding evaluation of information to interpretations from more than one perspective, outside of the immediate context (generalize).

Constructive Feedback and Awareness Training (CFAT)
CFAT uses calibration CRT (Ostergren 2017) to improve awareness through direct feedback and opportunities to self-evaluate performance, discover errors, and compensate for deficits (Ownsworth, Fleming, Desbois, Strong & Kuipers, 2006). CFAT includes education on the nature and characteristics of deficits, provision of feedback, and structured opportunities for self-reflection and self-prediction about performance on familiar and important real-world tasks. A core aspect of CFAT includes training directed at online (during task) and offline (before or after task) awareness (Ostergren, 2017). CFAT is recommended for individuals who demonstrate impaired self-awareness after a TBI (Ownsworth et al., 2006; Ownsworth, Quinn, Fleming, Kendall & Shum, 2010; Schmidt, Fleming, Ownsworth & Lannin, 2013).

CFAT is implemented in the steps of pre-task analysis, task implementation and feedback, and post-task reflection (Ostergren, 2017). Pre-task analysis involves the selection and organization of treatment tasks, with an emphasis on identifying real-world tasks that can be used effectively during the feedback stage of training. CFAT treatment tasks are evaluated by the clinician to identify potential errors. This will serve as the foundation for discussion before and after task completion (offline awareness training) and as feedback during task completion (online awareness training). The stage also includes engaging the individual with TBI in structured self-assessment and self-prediction of task performance before a task is performed (offline awareness). In the implementation and feedback stage, the clinician provides constructive feedback during and after task completion (either verbal, videotaped, or a combination thereof) (Richardson et al., 2015). Several researchers have recommended the use of Pause-Prompt-Praise format for providing CFAT feedback (Ownsworth et al., 2006; Schmidt et al., 2013). During post-task reflection, the clinician and client engage in similar discussion to the pre-task analysis step, but targeted toward analysis of the completed task, with the goal of facilitating self-identification of areas of strength and limitation (Ownsworth et al., 2010; Schmidt et al., 2013).

Conclusion and CRT Resources
This article provides but a brief sample of CRT approaches that have research evidence to support their use in the area of attention/information processing, memory, and executive function deficits after TBI. This just scratches the surface of the research foundations in this area, which is voluminous and ever expanding. SLPs are key team members in the provision of CRT to individuals with cognitive-communication disorders after TBI. To be effective in this role, SLPs must stay abreast of the most recent evidence in this area. At its core, CRT is expected to (ASHA, n.d., Treatment Options):

- Capitalize on strengths and address weaknesses related to underlying structures and functions that affect communication
- Facilitate the individual's activities and participation by assisting the person to acquire new skills and strategies
- Modify contextual factors that serve as barriers and enhance facilitators of successful communication and participation including development and use of appropriate accommodations.

SLPs can use these guiding principles in implementing CRT and in evaluating an ever growing research foundation. ASHA Practice Portal (available at https://www.asha.org/Practice-Portal/Clinical-Topics/Traumatic-Brain-Injury-in-Adults/) is an excellent source of summary information on this topic, as is ASHA’s Evidence Maps in this area. ♦
References


Improving Clinical Education Models through Shared Perspectives

Michael Dillon

Each day when I walk into my office, I am reminded of the importance of perspective. It is not some quote on an inspirational poster, although the image of an upside down kitten would go a long way in lightening up my decor. Surprisingly, my personal symbol of perspective is the very desk at which I sit. Almost a decade ago, I was sitting on the opposite side of that desk. I find that fact to be both humbling and, honestly, a bit alarming. There are many moments each week in which I find myself looking across that desk at a young man or woman who remind me very much of my younger self. In those moments, I am frequently trying to remind myself of how I felt when I was on their side of the desk.

I am fairly certain that those of you who share the responsibility that comes with being an instructor of student clinicians can relate to this. In our clinic, I am sure that our supervisors feel very much the same way about the two-way mirror as I do about my desk. I am even more certain that they share my desire to better understand our students. While we strive to empathize with our student clinicians, the students are also often left to hypothesize as to what we are thinking and feeling as we observe and interact with them.

The funny thing about both my desk and that two-way mirror is that my role requires me to assist and support the people on both sides of each of them. I consider myself very fortunate to be in this position, and I am quite honored to do so. We, at the University of Toledo, have committed ourselves to better connect the perspectives of these two groups, and I will share with you our first steps in doing so.

In order to improve the way in which we serve our students and supervisors, I needed to determine the perspectives of each group. My aim was to identify shared themes while also seeking any disconnect between the perceptions of each group. I did so by asking members of each group to not only describe their own role in the process of clinical education, but also the role of their counterparts. I received responses from 60 students at the graduate and undergraduate levels, and 10 supervisors. Below are word clouds generated from each group’s responses.

First, the students and supervisors on their perceived role of a supervisor:
Role of Supervisors

Although word clouds are not necessarily the most scientific model to use, the student perspective cloud speaks loud and clear. The words most frequently used by students were “constructive” and “feedback.” Both “guide” and “guidance” feature prominently, as well as “positive” and “specific.” Therefore, one might say that the students expect their supervisors to provide guidance through the use of specific, constructive feedback.

Our supervisors frequently used terms such as “provide,” “clinical,” “teach,” “skills,” “evaluate,” and “develop.” The words “specific” and “feedback” also appear, though less prominently than they did in the student responses. It would not be too much of a stretch to say that our colleagues who supervise student clinicians see their role as one of teaching, developing, and evaluating clinical skills.

When you put these two perspectives together, it would seem that the supervisors are telling us what they need to do, while the students are telling us how they would prefer that it be done. It then becomes our responsibility as a program to support our supervisors in developing their ability to utilize this technique.

I always favor the term ‘constructive feedback’ over ‘constructive criticism.’ ‘Criticism’ implies that we only discuss what went wrong during a session and/or interaction. However, ‘feedback’ is a term that gives us leeway to discuss what went wrong AND, just as importantly, what went well. In order to be truly self-reflective learners and future clinicians, our students need both.

One student said, “I feel that we should be getting more feedback than just, ‘great job.’ Sometimes I honestly don’t know what I did that was so great, so then I don’t know what to repeat.” There were many other responses quite similar to this one. Even those who are doing well still want specific feedback.

As professionals, we all know that we need to focus on both sides of the coin. Effective clinicians are always asking themselves, “What went well with this session and what will I do differently in the next session based on what I observed?” It is paramount that we are guiding our students to do the same. It is also less deflating to our students to hear some positives instead of a list of things they did wrong after each attempt. Modeling this thought process for our students will encourage them to begin to do this on their own.

Next, let us look at how both groups describe the students’ role in their own clinical education:

STUDENT
Role of Students

The perspectives of both students and supervisors regarding the role of students in their own clinical education yielded responses that would suggest active learning. Terms such as ‘write,’ ‘research,’ ‘ask,’ and ‘questions’ evoke images of students actively engaged in becoming better clinicians. There is definitely some agreement here as to how the students should be approaching their clinical development.

In contrast, there appears to be one central theme that students and supervisors do not share. Many of the supervisors’ responses addressed two similar, though not identical terms, ‘review’ and ‘reflect.’ This is quite telling, and it is congruent with some of my own observations of our students. The students, while very active in attempting to please the clients and supervisors, do not always spend time reviewing their actions or reflecting on sessions beyond completing their assigned SOAP note. They can become so consumed with their client’s progress that they somewhat neglect their own, or they can end up viewing sessions like a classroom assignment and looking to “get the grade.” These students are what we would call surface learners. Our supervisors, on the other hand, consistently report that they wish students would demonstrate more self-reflection and critical thinking skills on their own. In other words, we want our students to function more like deep learners (Berk & Visker, 2018).

When you put this together, what we, as supervisors, really want to see are students who ask questions, research solutions, AND are able to reflect on their own abilities/shortcomings and adjust accordingly. This critical thinking/self-reflection piece is the Holy Grail for us in clinical education. It is what truly will allow our students to become master clinicians.

It seems as though students want supervisors to provide them with strengths and weaknesses as they see them, while the supervisors are looking to shift that role from themselves to the students as they move through the experience. Based on the research that we have, that formula is correct. We just have to get the two groups on the same page.

Now What?

Armed with this information and with a growing number of resources provided by ASHA and our colleagues, we are setting out to make changes to the ways in which we discuss clinical education with our students, as well as how we provide support and educate our clinical supervisors. We are going to share this information with our supervisors, as well as our current and incoming students, to help bridge the perspectives of the two groups. We are developing supervision tools that will encourage constructive feedback on the part of our supervisors, allowing them to guide students to develop and assume self-reflection/critical thinking skills.

We want to better equip our supervisors to help students progress through Anderson’s Three Stage Supervision Continuum. We believe that this will result in students and supervisors spending less time in the initial stage of direct feedback, increasing the likelihood of moving toward the transitional and self-supervision stages in which the students begin to take more ownership of their development.

Finally, we are revising our feedback forms/supervisor evaluations to emphasize these major themes as areas of concentration in our clinical curriculum.

It is our hope that the individuals on either side of that observation mirror (or desk) can better serve each other and their shared clients by knowing, or being reminded of, how the other group views this relationship. Rather than just hoping that this will take place, we are choosing to be the catalyst for this change by taking the above actions on behalf of both of these valuable groups. It is my intention that sharing this information will be helpful to my colleagues as they...
continue to evolve as supervisors and/or in the development of procedures in their own clinic. After all, no matter what side of the mirror or desk you occupy, we all share the same perspective that our students represent the future of our treasured profession.

***You can find a growing number of resources from ASHA and other sources by visiting the Practice Portal section entitled, “Clinical Education and Supervision” (https://www.asha.org/Practice-Portal/Professional-Issues/Clinical-Education-and-Supervision/).

**Resources**


Continuing Education Questions

Directions: Choose the best answer for each question as you read each article. Then return to the Member Continuing Education Page for a link to answer the online assessment questions. A certificate of completion or ASHA continuing education units (CEUs) are available for a limited time.

Deficits of Language and Pragmatics Associated with Right Hemisphere Damage
12. Which of the following is a key problem with communication following right hemisphere stroke?
   a. Understanding intended meaning
   b. Interpreting passive sentences
   c. Short, inaccurate, and irrelevant answers to questions
   d. Producing passive sentences

13. A suppression deficit refers to:
   a. Inability to inhibit saying inappropriate things
   b. Inability to inhibit inappropriate actions
   c. Slowed inhibition of possible meanings that are not appropriate for the context
   d. Slowed activation of multiple meanings of a word

14. Right hemisphere strokes commonly result in:
   a. Difficulty generating all inferences
   b. Difficulty producing inferences in conversational speech
   c. Difficulty with inferences related to characters in a story
   d. Difficulty with some inferences, such as elaborative inferences

15. Deficits of theory of mind may be related to what other deficits associated with RHD?
   a. Unilateral neglect and awareness
   b. Humor and empathy
   c. Suppression and coarse coding
   d. Expressive and receptive prosody

Implications of Generational Differences on Clinical Supervision
16. Why do generational differences present challenges in clinical education?
   a. They can result in unstated assumptions and attitudes
   b. They can lead to misinterpretations
   c. They can create biases and stereotypes
   d. All of the above

17. Which generational group is most represented in undergraduate and graduate CSD programs?
   a. Baby Boomers
   b. Traditionalists
   c. Millennials
   d. Generation X
18. In order to understand the implications of generational differences on the supervision process, clinical supervisors should:
   a. Not work to become familiar with the characteristics of other generational groups
   b. Hang out with members of various generational groups to increase understanding of each
c. Dispel myths that pertain to different groups
d. Work with students based on them having a “collective personality”

19. Which one is “NOT” a strategy that should be used to bridge generational gaps?
   a. Talk about generational differences at department/clinic orientations
   b. Provide feedback on a monthly basis
c. Use written lesson plans to prepare and create structure
d. Establish clear expectations and discuss at the beginning of the supervisory process

Demystifying Voice Therapy

20. Physiologic voice therapy
   a. Aims to modify the physiology of voice production to improve vocal quality and function, increase vocal efficiency and comfort, and increase vocal endurance
   b. Uses facilitating techniques to alter aberrant vocal behaviors
c. Focuses on identifying and changing unhealthy vocal behaviors
d. Utilizes only indirect therapy interventions

21. Vocal hygiene is an example of
   a. Direct voice therapy
   b. Indirect voice therapy
c. Manual therapy
d. Semi-occluded vocal tract exercise

22. Which of the following voice therapy tools might be used to decrease breath holding and improve respiratory/phonatory coordination?
   a. Circumlaryngeal massage
   b. Vegetative sounds
c. Cup phonation
d. Flow phonation

23. In the voice therapy evaluation, what is the most important component of the instrumental assessment?
   a. Laryngeal videostroboscopy
   b. Acoustic assessment
c. Aerodynamic assessment
d. Diagnostic laryngoscopy

Interprofessional Education for Concussion Assessment

24. Interprofessional Education is defined as:
   a. Participating as a team
   b. Interacting with other team members and working on similar goals
c. Learning from and with each other
d. Educating each other about your own area of skills
25. Team members who should be involved in prolonged concussion symptom assessment include
   a. PT, SLP, NSG, OT, MD and Athletic Training
   b. MD and NSG
   c. SLP, OT, PT
   d. Athletic Training, PT, MD

26. Most people with mTBI recover within
   a. 1-2 weeks
   b. 3-4 weeks
   c. 3-4 months
   d. 1 year

27. Cognitive symptoms related to prolonged concussion include
   a. Attention, memory, executive functions, word retrieval
   b. Speech and language issues
   c. Memory only
   d. Math, reading, writing

Workshop Approach to Improve Graduate Students’ Self-Efficacy and Attitude

28. One’s self-efficacy in any given domain, such as clinical writing, is important as:
   a. Self-efficacy impacts one’s motivation and achievement
   b. Higher self-efficacy ensures better outcomes in the given domain
   c. Lower self-efficacy ensures better outcomes in the given domain
   d. Self-efficacy impacts one’s physiological state

29. Participants’ results from the Clinical Writing Self-Efficacy Scale (CWSES) at pre-, mid-, and post-intervention indicated participation in the Clinical Writing Workshop (CWW) resulted in:
   a. Participants having lower clinical writing self-efficacy
   b. Participants having no change in their clinical writing self-efficacy
   c. Participants having greater clinical writing self-efficacy
   d. Participants having more positive feelings towards clinical writing

30. From pre- to post-intervention, participants’ ratings on the Liking Clinical Writing Scale (LCWS) revealed:
   a. Participants who attended all Clinical Writing Workshop (CWW) sessions demonstrated the most positive attitudes towards clinical writing post-intervention
   b. Regardless of number of sessions attended, participants in the CWW demonstrated more positive attitudes towards clinical writing post-intervention
   c. Regardless of number of sessions attended, participants in the CWW demonstrated more negative attitudes towards clinical writing post-intervention
   d. Participants who attended the CWW for five or more sessions are predicted to have more positive attitudes towards clinical writing post-intervention

31. Considerations for future clinical writing interventions for speech-language pathology graduate students should include:
   a. Providing opportunities for practice, exposure to models (strong and weak), and feedback (immediate and delayed) for students
   b. The use of poor clinical writing models and delayed feedback
   c. The use of strong clinical writing models and immediate feedback
   d. Providing opportunities for practice and limited feedback
**Early Intervention Classroom-Based Experience**

32. What unique experience do student clinicians gain by providing speech and language services in an early intervention family-centered program?
   a. Language assessment
   b. Collaboration with families and teachers
   c. Speech assessment
   d. Individual supervision

33. Which one of these strategies may help students navigate challenges when adapting to a culturally and linguistically sensitive approach to enhanced milieu teaching?
   a. Milieu teaching
   b. Play at the child’s level
   c. Environmental arrangement
   d. Focus on the extended family, beyond the parent-child dyad

34. Classroom-based practicum experiences are particularly beneficial for _________
   a. Preparing graduate students for school externships
   b. Report writing
   c. Goal writing
   d. Attendance

35. Which of the following is not an essential step when developing an early intervention classroom-based practicum?
   a. Contact the agency
   b. Perform needs assessment
   c. Determine curriculum
   d. Secure therapy rooms at the agency

**Using Ethics in Evidence-Based Practice**

36. According to ASHA, what is the highest level of research evidence?
   a. Ia
   b. Ib
   c. IIa
   d. III

37. Which of the following is not part of the evidence-based practice definition?
   a. Patient testimonials
   b. Empirical research
   c. Patient and family preferences
   d. Clinical experience and judgment

38. Which of the following is related EBP as described by the ASHA Code of Ethics?
   a. Novel application of treatment methodologies
   b. Truth in advertising
   c. Reporting only favorable results
   d. Guaranteed outcomes
39. Which of the following is not included in PICO?
   a. Problem
   b. Investigation
   c. Comparison
   d. Outcome

*Let’s Talk Trachs*

40. Which of the following is an important physiological change that occurs as a result of tracheotomy?
   a. Increased saliva production
   b. Decrease gag reflex
   c. Redirection of normal air
   d. Inability to swallow

41. Which of the following is NOT a physiological effect of tracheotomy?
   a. Decreased subglottic pressure
   b. Disrupted phonation
   c. Desensitization of larynx and pharynx
   d. Increased reflux

42. Which of the following is not a benefit of one-way speaking valves?
   a. Promotes wound healing
   b. Restoration of subglottic pressure
   c. Restoration of phonation
   d. Potential for improvement in swallow function in some patients

43. Which of the following is a benefit of multidisciplinary tracheostomy teams for patients with tracheostomies?
   a. Increased referrals for speaking valve evaluations
   b. Increased billing potential
   c. Increased camaraderie with co-workers
   d. Longer NPO times for patients with inflated cuffs

*Cognitive Rehabilitation Therapy: Implementation with adults with TBI*

44. Cognitive rehabilitation therapy (CRT) is
   a. Used primarily for individuals with TBI in the acute phase of recovery
   b. A functionally oriented service of therapeutic cognitive activities, based on an assessment and understanding of the person’s brain-behavioral deficits
   c. Effective for individuals with cognitive impairments due to stroke, but not due to TBI
   d. A new approach to targeting cognitive impairments after a TBI

45. Cognitive-communication impairments after TBI:
   a. Cannot be improved using CRT
   b. Are within the scope of services of an SLP
   c. Are due to language impairments
   d. Should be treated separately from CRT
46. Time Pressure Management (TPM):
   a. Seeks to address slowed information processing following TBI by providing training in specific strategies to prevent or reduce time pressures
   b. Is effective for individuals with intact divided attention
   c. Is a form of restoration CRT
   d. Has limited research evidence to support its use within individuals with TBI

47. Strategic Memory and Reasoning Training (SMART):
   a. Trains individuals with TBI to perform two tasks at once
   b. Is best implemented for those with stroke, but not TBI
   c. Uses calibration CRT to improve gist reasoning following TBI
   d. Is a CRT approach targeting sustained attention
Guidelines for Submission to eHearsay

**eHearsay**, the electronic journal of the Ohio Speech-Language-Hearing Association, is designed to address the professional development needs of the members of the state association.


### Types of Manuscripts

Contributed manuscripts may take any of the following forms:

- **Research Article:** Full-length articles presenting important new research results. Research articles include an abstract, introduction, methods and results sections, discussion, and relevant citations. These are typically limited to 40 manuscript pages including citations, tables, and figures. Large data sets and other supplementary materials are welcome for inclusion in the online publication.

- **Review:** A comprehensive overview of an area of speech, language, or hearing sciences and/or disorders (i.e., systematic review or meta-analysis). Reviews should be accessible to knowledgeable readers not expert in the subject area. They should be prepared with the same rigor as a research article reporting specific results. These are typically limited to 40 manuscript pages including citations, tables, and figures.

- **Tutorial:** Educational expositions covering recent literature on topics of interest to clinicians and other scholars. These are typically limited to 40 manuscript pages including citations, tables, and figures.

- **Research Forum:** The purpose of a research forum (RF) is to provide a concentrated focus on a special topic deemed to be of high interest to the readership. An RF contains a series of empirical studies centering on a key aspect of speech, language, hearing, or swallowing science and/or disorders. RFs may also comprise a set of scholarly papers presented at a scientific conference.
  - A proposal for an RF must be approved for consideration by the journal editor prior to forum development. Pre-approval by an editor does not guarantee that any or all manuscripts submitted will be accepted for publication. The proposal should (1) provide a forum summary, (2) outline the probable manuscript titles and author lists, (3) state whether a prologue and/or epilogue is planned, and (4) designate one person, a forum coordinator, as the point of contact and coordinator of communications with forum authors.

- **Letter to the Editor:** Opinions about material previously published in the journal or views on topics of current relevance. A letter relating to work published in the journal will ordinarily be referred to the author(s) of the original item for a response, which may be published along with the letter. Letters are typically limited to 15 manuscript pages, including citations, tables, and figures.

- **Clinical Focus:** Articles that may be of primary clinical interest but may not have a traditional research format. Case studies, descriptions of clinical programs, and innovative clinical services and activities are among the possibilities.

- **Viewpoint:** Scholarly based opinion(s) on an issue of clinical relevance that currently may be neglected, controversial, related to future legislation, or could serve to update the readership on current thinking in an area.
Manuscript Style and Requirements

Style Manual
Authors are expected to follow the style specified in the *Publication Manual of the American Psychological Association* (6th edition).

Language Policies
OSLHA policy requires the use of nonsexist and person-first language in preparing manuscripts.

Page Limit
A guideline of 40 pages (including title page, abstract, text, acknowledgments, references, appendices, tables, and figures) is suggested as an upper limit for manuscript length. Longer manuscripts, particularly for critical reviews and extended data-based reports, will not be excluded from review, but the author(s) should be prepared to justify the length of the manuscript if requested to do so.

Peer Review
All manuscripts are peer reviewed, typically by at least two reviewers with relevant expertise, an issue editor (if applicable), and the journal editor. Correspondence between authors and editors is expected to be professional in tone. If correspondence is not conducted in a professional manner, an editor has the option to bring the matter before the OSLHA Directory of Technology and Publications and/or OSLHA’s Executive Council. After consultation with the Directory of Technology and Publications, the editor may terminate the peer review process for that submission. The author has the right to appeal to the OSLHA Directory of Technology and Publications and/or OSLHA’s Executive Council.

Authorship & Author Disclosures
During manuscript submission, answers to a number of disclosures will be required. The corresponding author:

- Affirms that all of the authors listed in the byline have made contributions appropriate for assumption of authorship, have consented to the byline order, and have agreed to submission of the manuscript in its current form
- Affirms that all applicable research adheres to basic ethical considerations for the protection of human or animal participants in research
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- Affirms that the manuscript has not been previously published in the same, or essentially the same, form
- Affirms that the manuscript is not currently under review elsewhere. OSLHA prefers to publish previously unpublished material
- Discloses information about any previous public presentation of the data reported in the submitted manuscript, including at a scientific meeting or in conference proceedings, book chapters, websites, or related media
- Discloses any real or potential conflicts of interest that could be seen as having an influence on the research (e.g., financial interests in a test or procedure, funding by an equipment or materials manufacturer for efficacy research)

CALL FOR PAPERS
Submit your manuscript at any time by sending it to the Journal Editor: Laurie.sheehy@utoledo.edu or the Business Office oslhaoffice@ohioslha.org
Dear OSLHA Members,

I hope you enjoyed the articles that were in this issue of eHearsay.

OSLHA needs YOU!! Based on some of the 2018 membership survey results, it sounds like YOU want to be more involved in OSLHA. There are opportunities for you to get involved with eHearsay:

- **Become a Peer Reviewer**
  - Send your resume/CV to Laurie.Sheehy@utoledo.edu and let me if you have an area of expertise

- **Become an Author or Co-Author**
  - eHearsay publishes all types of manuscripts including: tutorials, reviews, clinical focus, viewpoint, research studies (even those with 1-5 participants).
  - OSLHA has also published student papers in the past. If you are a University professor and you require your students to write a paper, it may be of interest to our members. In years past we've had student papers re: meta-analysis (Case Western Reserve), group intervention in dementia (Baldwin-Wallace), English Language Learners (University of Cincinnati), Hearing status of children in developing nations (University of Toledo), Acceptance & Commitment Therapy for stuttering (University of Akron)

- **Be a Guest Editor**
  - If you have a topic you are passionate about (e.g., Dysphagia, Head/Neck Cancer, Autism, Dyslexia, Fluency Disorders, Audiology Issues) and think you can get 4+ articles together on the subject, you can be a guest editor for a topic of your choosing.

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Laurie M. Sheehy
eHearsay Journal Editor