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EVIDENCE-BASED PRACTICE:
A RETROSPECTIVE OVERVIEW AND
PROPOSAL FOR FUTURE DIRECTIONS

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Evidence-Based Practice: A Retrospective Overview and Proposal for Future Directions

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Introduction

This is the first article of the Volume 7 *EBP Briefs*. The *Briefs* provide explicit guidance in how to approach specific clinical questions and rich models of implementing evidence-based practice as a systematic clinical-care process.

EBP Briefs first appeared in the winter of 2006, quite soon after the American Speech-Language-Hearing Association (ASHA) formally introduced evidence-based practice (EBP) in a position statement (ASHA, 2005a). “It is the position of the American Speech-Language-Hearing Association that audiologists and speech-language pathologists incorporate the principles of evidence-based practice in clinical decision making to provide high quality clinical care” (p. 1). *EBP Briefs* are intended to support clinicians who incorporate these principles in their clinical practices. In this article, we have taken a step back from the typical framework of identifying a question on a specific clinical topic and then addressing that question. This article provides a retrospective overview of (a) the construct of EBP, including what it is and what it is not; (b) changes in the field as a result of implementing EBP; and (c) future directions for ensuring that EBP principles are incorporated in a way that results in high-quality clinical care.

Evidence-Based Practice: Overview of the Construct

The definition of evidence-based practice (EBP) has not changed since ASHA officially endorsed it in the 2004 Technical Report. In its most technical form, EBP is defined as “the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients by integrating individual clinical expertise with the best available external clinical evidence from systematic research” (Sackett, Rosenberg, Gray, Haynes, & Richardson, 1996). EBP was originally

adopted in the medical field as a response to concerns that clinical decisions were typically “idiosyncratic and often ill-informed.” Healthcare professionals were said to be making “life and death treatment decisions based on conflicting anecdotes and calculated appeals on emotions” (Millenson, 1997, p. 6). Although researchers and clinicians from a number of professions generally agree on the definition of EBP, there remains much debate on how to apply this process in speech-language pathology and audiology clinical practice. Specifically, questions remain as to what constitutes “best evidence” (see Bernstein Ratner, 2006; Kamhi, 2006a).

One significant addition to the literature is what EBP is *not*. EBP is not a descriptor of endorsed, research-based programs and practices (Justice, 2008; Kamhi, 2006a). It is not, in and of itself, justification for one clinician’s preferred treatment approach (Kamhi, 2006b), and it is not the exclusive application of results from high-quality, randomized controlled trials (RCTs; Kamhi, 2006a).

What EBP refers to is a *process* (Justice, 2008) in which the clinician collectively considers three main components (patient values/needs, clinical expertise, and current research) in making clinical decisions (Kamhi, 2006a; Straus & Sackett, 1998). It is critical for speech-language pathology and audiology professionals to recognize that none of these three EBP components is static. As any one aspect changes, the others necessarily develop as well.

Sackett et al. (1996) proposed two premises to guide clinicians’ application of EBP in speech-language pathology:

1. Clinicians’ skills grow as new information becomes available.

As Bernstein Ratner suggests in her 2006 commentary on EBP, clinicians cannot rely on graduate school training to guide clinical decision-making throughout their entire careers. As new research is conducted and results are shared, professional opinion and judgment must adapt accordingly.

2. Clinicians should continuously seek new information to improve therapy efficacy.

As clinicians read and apply research to specific clients and draw conclusions on the effectiveness of a certain methodology for a given population, their expertise and base for making clinical decisions expands. As their expertise expands, clinicians develop new questions relevant to clinical populations. These questions then help to highlight gaps in our professional knowledge base, which informs researchers of relevant and needed scientific endeavors (Justice, 2008). As our research base expands, so does the pool of information available to clinicians, which optimally affects client/patient care. As such, clinical expertise and current research are not stagnant entities but rather operate in a symbiotic fashion. *That* is the essence of EBP.

As with any process, there are several steps to conducting EBP as originally outlined by Straus and Sackett (1998), including asking clinically relevant and answerable questions, finding the best evidence, critically appraising the evidence, integrating evidence and applying it to practice, and evaluating the process.

Five Components of Engaging in Evidence-Based Practice

Ask clinically relevant, answerable questions. The first step in EBP is asking specific, clinically motivated questions. EBP is not simply a matter of keeping current on new research and regularly reading journal articles. A clinician could potentially read research-based journal articles in speech-language pathology, audiology, and related sciences on a weekly basis. Although this may be good professional practice, such general reading may or may not inform the clinician on issues pertinent to his or her clients. Asking specific, clinically motivated questions requires identification of a need for specific information relevant to clinical practice and the transformation of that need into an answerable question (Straus & Sackett, 1998). This, in and of itself, could pose a daunting task to clinicians as the potential number of clinically relevant questions is exponential. Straus and Sackett suggest identifying questions that are 1) most important to a patient's (or client's) well-being, 2) most feasible to answer, 3) most interesting to the clinician, and 4) most likely to be applicable to other patients/clients (1998).

Once identified, clinically motivated questions can be framed in a PICO format (Straus & Sackett, 1998). In this format, the *P* refers to the *patient* or *problem* in question. For example, clinicians may have a question related to preschoolers with language disorders and emergent literacy development (patient). The *I* refers to an *intervention* being considered, such as explicit teaching of alphabet knowledge. The *C* represents another intervention currently being used as a *comparison*, such as traditional language-based intervention. Gierut (2005) suggests that clinicians expand such questions to consider all aspects of clinical decisions, including what to treat, how long to treat, and how to treat. Finally, *O* refers to the *outcome* of interest for this specific patient or population. In this example, the outcome may refer to increased alphabet knowledge and improved scores on a standardized measure of this construct. Combined, the clinically motivated question would be "For preschoolers with language disorders, does explicit teaching of alphabet knowledge or traditional language-based intervention result in improved scores on a standardized measure of alphabet knowledge?"

Find best evidence. After forming the question, the next step in EBP is to find the evidence-based answer. Many tools can be used to obtain evidence, including clinical examinations (Straus & Sackett, 1998), information from trial therapy, and dynamic assessments (Kamhi, 2006a), but published research is the most common method of collecting information. Clinicians need to evaluate research to ensure that it was conducted in a way that results can be considered both reliable and valid.

Many systems exist for evaluating the quality of research articles. ASHA outlines five themes consistent among all rating systems relevant to EBP (2004). The first theme is *independent confirmation and converging evidence*. Evidence is rated higher for meta-analyses that summarize findings from multiple studies of a given topic. As research findings are replicated across time, clinicians can be more confident of the results and application of those findings.

The second theme is *experimental control*. Experimental studies with a control group and random assignment of participants to conditions (e.g., a treatment condition and a control condition) have stronger evidence of internal validity, statistical conclusion validity, and unbiased estimates of treatment effects (Shadish, Cook, & Campbell, 2002) than studies without random assignment (i.e., quasi-experimental designs). Both of these types of

experimental studies outrank those with correlational designs, also known as nonexperimental studies, and single-subject designs, with respect to the strength of any causal claims that could be drawn from the experiment.

The third theme when evaluating research articles is the *avoidance of subjectivity and bias*. This aspect of research quality refers to the “blinding” of participants, clinicians, and researchers in terms of treatment and measurement. Studies that blind all participants to the treatment group to which they belong and use external examiners to collect outcome measures rank higher than studies lacking such precautions. Studies in the medical literature have documented that treatment effects are significantly higher for studies without blinding compared to those with blinding because clinicians by nature tend to believe so strongly in the impact of their interventions (Schulz, Chalmers, Hayes, & Altman, 1995).

The fourth theme related to quality of research articles concerns issues of *effect size* and *confidence intervals*. Clinicians should assess whether or not a study has enough statistical power to identify significant effects and whether or not those effects have practical significance to the subject matter. Additionally, studies should report confidence intervals (CI) as an indicator of the range of values within which one might expect to see similar effects or scores. Generally, studies with narrower CIs suggest stronger, more precise evidence than studies with wider CIs.

The fifth theme speaks of the *relevance* and *feasibility* of a given study. The relevance of a research study will differ depending on the clinician asking the question and what question is being asked. Research studies that match closely with a clinician’s targeted population and that approach a question the clinician could not readily answer independently are ranked high in relevance. Feasibility, on the other hand, relates to the practical nature of the study. Could the assessment techniques, treatment design, or intervention be easily replicated in the real world? The higher the feasibility of implementation, the higher a study will score in this theme of quality.

Critically appraise evidence. After identifying the research evidence, clinicians have the responsibility of critically evaluating the information. Using the previously indicated five themes, clinicians must assess the quality of the research design, the validity of constructs being measured, and the reliability of results, as well as consider the clinical application of the study findings (e.g., Does the research

indicate that one treatment technique is better than another? Are findings among studies mixed in their results? Do both treatment approaches show positive outcomes?).

Integrate evidence and apply to practice. This fourth step of the EBP process involves integrating research evidence with clinical expertise and patient values and preferences. At this point in the process, the clinician has answered his/her clinically motivated question using the PICO format. Arguably, other clinicians asking similar questions could arrive at the same answer. However, how that particular intervention is incorporated into a caseload could look very different from clinician to clinician. Each clinician has varying skills and proficiencies that may affect the feasibility and application of new treatment designs. Additionally, each patient is different. The clinician must consider not only the research findings and his/her abilities as a professional, but also the needs, values, and preferences of each patient. It is this step that makes EBP more than just staying up-to-date with current research.

Evaluate. Straus and Sackett (1998) recommend that clinicians evaluate their process of engaging in EBP at each step. Was the clinically motivated question written in a way that was answerable? Was strong evidence found in a timely manner? Was it evaluated accurately? Was the information integrated effectively and efficiently? As with any skill, the process of applying EBP takes practice to become proficient. Clinicians who routinely ask relevant questions and search the literature for answers are poised to become more efficient users of such information and overall experts in the process of EBP.

Changes in the Field of Practice: Effects of Implementing EBP

Evidence is lacking as to whether clinicians are actually engaging in EBP and, in turn, whether use of the EBP process contributes to improved treatment outcomes. That, indeed, is an important and necessary avenue of future research. Although it is unclear whether EBP has improved clinical practices and client outcomes, there are some obvious ways in which the movement to EBP has changed, if not advanced, the fields of speech-language pathology, audiology, and related clinical disciplines.

The shift to EBP has resulted in a number of efforts for organizing and prioritizing information about effective

assessment and treatment approaches to include identification of the more promising options available. These include, for instance:

- The ASHA Compendium of EBP Guidelines and Systematic Reviews (N-CEP; www.asha.org/members/ebp/compendium/), an online resource, serves as a clearinghouse of all guidelines and reviews available across a full range of topics of relevance to the treatment of communication disorders. A similar compendium is available at SpeechBITE (speech pathology database for best interventions and treatment efficacy; <http://www.speechbite.com/ebp.php>).
- Specialized journals have been designed to provide clinicians with information about effective treatment approaches and how to utilize EBP, to include not only *EBP Briefs* but also *Evidence-Based Communication Assessment and Intervention*. In a number of non-specialized journals, such as the *American Journal of Speech-Language Pathology*, structural abstracts are being used with research articles to provide readers a more uniform way to search for and extract key information about study methods and findings.

The shift to EBP has heightened clinicians' awareness of what constitutes high-quality research and what type of evidence is needed for a particular treatment to be considered empirically validated. Regarding the former, studies of the methodological features of empirical research have shown that not all research published in journals, even those journals that are highly regarded, is of high quality (e.g., Troia, 1999). Justice, Nye, Schwarz, McGinty, and Rivera (2008) examined the methodological quality of 53 experimental studies involving treatment for communication disorders; they showed that these studies were highly variable in their quality despite all appearing in three of the top-tier journals in communication disorders. Such work highlights the need for consumers to be critical reviewers of the research they are reading for clinical guidance. A noteworthy effort to improve both the reporting and quality of clinical trials is the work of the CONSORT Group (www.consort-statement.org/), which provides a 25-point checklist investigators and editors can use to promote quality reporting.

The shift to EBP has also helped highlight the type of research from which strong causal claims can be drawn regarding various treatment effects (typically the randomized controlled trial). The use of EBP also has served as the

basis for comparison in identifying the problems with claims of effectiveness made in other sources (including professional opinion and even policy statements). A critical contribution of EBP is the organization of information that distinguishes the highest quality of evidence (i.e., systematic reviews) from the lowest quality (expert opinion). A very exciting development in the field is the TRIP Database (Turning Research into Practice; www.tripdatabase.com), a search engine used to answer clinical questions that organizes output as a function of the level of evidence.

Tools that help clinicians understand the quality of evidence available for a given practice are an important advance, as historically expert opinion and policy documents could be quite influential in clinical decision-making. Having tools that support a more critical assessment of available research is also necessary, as it is often the case that scientists themselves will draw causal conclusions from studies for which the design does not permit such claims to be made, including correlational work (Robinson, Levin, Thomas, Pituch, & Vaughn, 2007). Of concern is that such causal conclusions—also referred to as prescriptive statements—tend to be perpetuated in future research reports (Shaw, Walls, Dacy, Levin, & Robinson, 2010) and can lead to a field erroneously viewing a specific intervention as being effective when, in fact, its effectiveness was never actually assessed.

The increasing use of EBP has promoted a general interest in ensuring that the treatments provided are effective. Decisions made regarding effective treatments were often governed more by theory than practice. Graduate training programs in speech-language pathology, audiology, and related fields typically have emphasized improving students' knowledge of theory over empirically supported practices. This approach has changed dramatically in the last decade. In 2005, for instance, certification standards for SLPs were modified to include explicit reference to EBP. Persons applying for certification must be able to integrate research principles into EBP (ASHA, 2005b). Accordingly, many graduate training programs now infuse content related to EBP into the range of pre-professional coursework. Theory remains important for understanding the nature of typical and disordered communication, but there is a strong sense of urgency across most, if not all, clinical disciplines—speech-language pathology and audiology included—regarding the importance of ensuring the effectiveness of treatments.

Future Challenges and Foci

The evolving application of EBP in speech-language pathology, audiology, and related fields has been exciting to follow and participate in. The premise of EBP is that clinical practices will improve and, as a result, treatments of communication disorders (and any other health- and medical-related concerns) will be more effective. As noted early in this brief, there have been long-standing concerns across many clinical disciplines that practitioners make decisions in idiosyncratic and even ill-formed ways. By being more systematic and integrating objective, high-quality research evidence within decision-making processes, clinical practices and outcomes will be enhanced.

One way to describe the shift toward EBP may be to conceptualize the first generation of work (roughly 2004–2012) as integrating the definition/construct of EBP into the clinical mindset and generating a series of tools (e.g., compendia, systematic reviews, clearinghouses) for professional use. We are poised to shift to the second generation of EBP, which involves assessing the quality of clinical practice when EBP is utilized and determining whether speech-language services have decisive positive impacts on the clients we serve. Just as the tenets of EBP assert that clinicians need to use the highest form of evidence to guide clinical practice, we must ensure that using EBP itself is superior to other models of clinical services. Although EBP has intuitive appeal, is there evidence to suggest that it improves clinical practices and, in turn, clinical outcomes?

Moving into the second generation of EBP, there are many more questions to be answered and challenges to confront. We must address the paucity of adequate, relevant research to effectively engage in EBP in a culturally and linguistically diverse world. Does the highest form of evidence available for a given intervention include demonstration that its effects were observed across cultural, racial, and linguistic groups? There are many interventions for which this most certainly will not be the case, in which clinicians may do best to employ reason-based practice (Cirrin et al., 2010).

We also must prepare our research community to conduct the types and quality of research that provides for valid, causal interpretations of treatment outcomes. This type of research is highly complex, particularly when one is studying treatment effects as might occur in business-as-usual clinical conditions in which clinicians—rather than

researchers—implement treatments with nonidealized versions of clients. Such work is methodologically complex, requires large numbers of participants, and involves advanced forms of statistical modeling, such as multi-level modeling. It may be that special initiatives are required to build this capacity in our research community, similar to what has been pursued in the education sciences.

Finally, we must carefully determine if our clinical practices are, in fact, adhering to the tenets of EBP. Are clinicians attending to the empirical evidence presented in the literature and integrating it into their clinical decision-making? If so, does this reduce the heterogeneity of practices that makes clinical practices appear idiosyncratic? The answer to these questions will be critically assessed in Volume 7 of the *EBP Briefs*.

Effective implementation of EBP, as measured by changes in clinical care and client outcomes, is challenging. Although the fundamental aspects of EBP are relatively straightforward, the realities of integrating EBP into the realm of daily speech-language pathology practice is highly complex. The first generation of EBP has done much to heighten awareness of the potential dangers associated with relying solely on experience, to initiate a relationship between research and practice, and to establish resources for clinicians to access current information more easily; but this is just a beginning. Answering the questions and challenges associated with the second generation of EBP requires a deeper and more introspective look into the professions across research and practice as we continue to pursue high-quality clinical care for people with communication disorders.

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