

Volume 2, Issue 4, December 2007

# EBP *briefs*

A scholarly forum for guiding evidence-based  
practices in speech-language pathology

EVIDENCE-BASED PRACTICE FOR  
SCHOOL-AGE STUTTERING:  
BALANCING EXISTING RESEARCH  
WITH CLINICAL PRACTICE

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Cite this document as:

Yaruss, J. S., & Pelczarski, K. (2007).  
Evidence-based practice for school-age stuttering:  
Balancing existing research with clinical practice.  
EBP Briefs, 2(4), 1-8.

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# Evidence-Based Practice for School-Age Stuttering: Balancing Existing Research with Clinical Practice

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## *Clinical Scenario*

Eleanor is a public school speech-language pathologist working in a large and growing suburban district. Her caseload consists primarily of children with language and learning difficulties, though she is seeing an increasing number of children with reading concerns, as well as children on the Autism spectrum. She splits her time between the middle school and high school buildings and works hard to face the challenges of her large and varied caseload.

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**A well-formed  
clinical question  
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Early each school year, Eleanor conducts screenings of children who are entering middle school to identify those who may be in need of speech and language services. She is acutely aware of the importance of good communication skills for children's educational and social development, and she wants to ensure that these incoming students have the best opportunity to succeed in their new setting. She always strives to provide optimal service for children with speech and language impairments, in accordance with the requirements of the Individuals with Disabilities Education Act (IDEA; United States Congress, 1997; United States Department of Education, 2006), and the American Speech-Language and Hearing Association (ASHA) Code of Ethics (ASHA, 2003) and Scope of Practice (ASHA, 2001).

This year, Eleanor is facing a unique challenge. On her screening schedule is a new fifth grade girl with a history of stuttering. The child, Emily, has been receiving treatment since she was in preschool, yet she still stutters severely and has difficulty communicating at school. Parental reports and prior treatment summaries indicate that Emily is able to use various modifications to enhance her fluency while she is in the therapy room, though she rarely, if ever, uses such techniques in the classroom or at home. Of particular concern is the fact that Emily's behavior

at school has started to change. Once an outgoing and friendly girl who regularly and enthusiastically contributed to class discussions, Emily has become quiet and taciturn. She is reluctant to participate in class activities and no longer raises her hand to answer questions. She sits alone at lunch and rarely calls her friends on the phone after school. When asked about these changes, she says that stuttering is embarrassing, so she finds it easier to just not talk. When asked why she does not use the techniques she has learned in therapy, she states, "they're just too hard" and "they don't really help." Although the school year has just begun, Emily's parents have already contacted Eleanor twice asking how the new clinician will help their daughter. The teacher has also asked what to do about Emily's speech in the classroom.

Unfortunately, like so many other speech-language pathologists, Eleanor does not feel confident in her skills for helping children who stutter (Brisk, Healey, & Hux, 1997; Cooper & Cooper, 1996; Kelly et al., 1997). She recalls some of the information presented in her graduate class on stuttering, but she has worked with very few children who stutter in her career. As a result, she is uncertain about how to approach this situation. She knows that children can learn techniques that improve their fluency, but she also knows from talking with other clinicians that generalization of such skills can be particularly challenging.

Because she understands the importance of the research base in making clinical decisions, Eleanor decides to consult the literature to help her identify an appropriate treatment. She recalls from graduate school that there is a wealth of research in fluency disorders. In fact, the sheer size of the literature causes trepidation as she approaches this case. She knows that she cannot possibly evaluate all of the treatment studies on school-age children who stutter, but she also knows that she can simplify her search for evidence by employing the principles of evidence-based practice (EBP). Specifically, she can: (a) pose a well-formed clinical question, (b) search the literature for relevant evidence, (c) evaluate the quality of the evidence she finds, and

(d) make a clinical decision based on the evidence (ASHA, 2005). Eleanor also recognizes that the application of EBP must take into account not only the existing literature, but also the unique needs of the children with whom she works. Therefore, she must also: (e) apply the results of her search to clinical practice by implementing a specific treatment strategy, and (f) ensure that the treatment is effective for the specific child with whom she is working. This *EBP Brief* outlines one way that clinicians can provide treatment that is supported by the research literature *and* is appropriate for each child's individual needs.

### *The Clinical Question*

A well-formed clinical question helps clinicians keep the needs of their clients foremost in their minds as they examine the research literature. One common framework for formulating such questions is summarized in the acronym PICO (e.g., Richardson, Wilson, Nishikawa, & Hayward, 1995), in which P represents the patient or population being addressed; I represents the intervention under consideration; C represents comparisons that can be made between intervention alternatives; and O represents the outcome the clinician hopes to achieve. Eleanor has often seen the PICO framework applied to clinical

questions; however, she has also seen that it is not always easy to define the components of the clinical question in such simple terms.

In this case, Eleanor sees that defining "P" (population) as all "school-age children who stutter" is too broad, because

different children have different experiences. At the same time, "P" cannot refer only to this specific fifth-grader, because there will not be any literature describing Emily's unique circumstances. Thus, "P" must refer to a *subset* of children who stutter who experience difficulties with their speech fluency or overall communication that are similar to those experienced by Emily. Eleanor encounters similar problems defining "I" (intervention) and "C" (comparison). She wonders if she should consider only self-contained treatment approaches or if she should draw from different approaches that address different aspects of Emily's overall stuttering disorder. Defining "O" (outcome) is particularly

difficult, because it is not clear whether the goal of treatment should be fostering generalization of Emily's existing speaking skills, teaching new skills, or addressing the social and educational challenges Emily is facing. Furthermore, Eleanor knows that consideration of all of these factors is complicated by the fact that Emily has previously received therapy, for many years, with questionable efficacy.

Nevertheless, Eleanor is eager to explore the literature and select an effective treatment program for Emily, so she constructs a preliminary clinical question to guide her initial inquiries. For *population*, she focuses on school-age children who stutter who are experiencing difficulty communicating in educational and social settings. She feels confident that this is an appropriate scope for her inquiries, for IDEA directs clinicians to address the "adverse educational impact" experienced by children receiving speech and language services. For *intervention*, she decides to consider a wide variety of treatment approaches so she can select specific components of treatment, as needed, to address the varied difficulties that Emily presents. And, for *comparison*, she decides to consider studies that compare intervention to no treatment, as well as studies that compare alternate treatment approaches.

Selecting the preferred *outcome* poses a greater challenge. Eleanor would like to help Emily improve her fluency so that she will no longer experience any problems associated with stuttering. Unfortunately, parental input and existing clinical reports show that prior treatment has failed to eliminate Emily's stuttering. Also, the techniques that Emily has learned have not generalized to educational and social settings, and Emily's restricted participation suggests that her overt stuttering behaviors may not present the primary barrier to successful communication. Fortunately, Eleanor knows that the ASHA scope of practice does not limit her treatment only to surface speech behaviors. In fact, the scope of practice specifically states that "speech-language pathologists work to improve quality of life by reducing impairments in body functions and structures, activity limitations, participation restrictions, and environmental barriers" (ASHA, 2001, p. 4). Thus, Eleanor strives to achieve an outcome in which Emily can minimize the limitations she experiences in daily activities and reduce the restrictions she experiences when participating in educational and social endeavors (see also Yaruss & Quesal, 2004).

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**The clinical question Eleanor addresses focuses on school-age children who stutter and their participation in educational and social activities**

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Combining these decisions, Eleanor defines her preliminary clinical question: “What treatment options help school-age children who stutter improve their communication so they can participate fully in educational and social activities?” She feels that this question is sufficiently broad and flexible that she will be able to find some studies to review while still keeping this client’s unique situation in mind when developing an individualized treatment plan.

### *Search for Evidence*

Eleanor starts her search for evidence using resources available on the internet. She knows better than to use a standard Google search, for this will not always provide her with findings that are based on research. (Still, she has found that Google Scholar can help her locate and obtain articles that she might otherwise have difficulty accessing.) Instead, she uses PubMed (<http://www.pubmed.gov>) and ASHA’s journals (<http://journals.asha.org>) to facilitate her search for relevant articles. She refers to her carefully planned clinical question and selects her initial search terms. Casting what she hopes will be a wide net, she selects “school-age,” “stuttering,” and “treatment.”

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**Eleanor’s search of the research literature identifies relatively few research-based papers on her topic**

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that one is a systematic review of the stuttering treatment literature (Bothe, Davidow, Bramlett, & Ingham, 2006). She downloads that article, as well as others that review research findings (e.g., Andrews, Guitar, & Howie, 1980; Hayhow & Stewart, 2005; St. Louis & Westbrook, 1987; Thomas & Howell, 2001). Next, she refines her search to focus more specifically on “communication” abilities, as specified in her clinical question. This narrows her list to only 9 papers, though many of these are not research-based. Finally, to keep her focus on her young client’s need to improve communication at school, Eleanor tries adding a variety of other search terms including “classroom,” “education,” “classroom,” and “activities.” A very small list of papers recurs in these searches, so she feels that she has obtained an appropriate list for her initial evaluation of the available evidence.

### *Evaluating the Evidence*

Eleanor begins her analysis of the evidence by reading the systematic review she found in her online search (Bothe et al., 2006). Of course, she intends to supplement this review with her own reading of the literature, but she feels that the review is an excellent place to start, for it specifies clear inclusion criteria for the studies that are examined and applies

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**Most of the treatment approaches described in the stuttering literature have focused on fluency improvements in particular settings, such as the therapy room**

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widely accepted standards for evaluating the level of evidence presented in the research. Of 162 studies of stuttering treatment outcomes published between 1970 and 2005, 39 met the study’s trial-quality inclusion criteria. Only 9 of these involved school-age children. These studies examined a variety of treatments, including EMG biofeedback (Craig & Cleary, 1982; Craig et al., 1996; Hancock, et al., 1998), Gradual Increase in Length and Complexity of Utterances (GILCU; Ryan & Ryan, 1983, 1995), prolonged speech (Craig et al., 1996; Onslow, Costa, Andrews, Harrison, & Packman, 1996; Ryan & Ryan, 1983, 1985), regulated breathing and airflow (de Kinkelder & Boelens, 1998; Ladouceur & Martineau, 1982), response contingencies (Ingham, 1980; Ryan & Ryan, 1983), and a form of stuttering modification (Ryan & Ryan, 1983). Eleanor notes with interest that most of these treatment approaches involve changes to speech production or reinforcement of fluent speech aimed at increasing the child’s fluency. For example, EMG biofeedback, prolonged speech, regulated breathing, and airflow techniques are all aimed at modifying the child’s speaking style, for instance, by reducing speaking rate, to minimize the chances of stuttering and enhance the likelihood that the child will produce fluent speech.

Results of the reviewed studies showed that children can achieve improvements in their speech fluency. At the same time, however, the literature review also highlighted the fact that children’s ability to use these treatment techniques in different settings and to maintain improvements in speech fluency over time appears to be a significant concern (Bothe et al., 2006; see also Finn, 2003). Results of the systematic review were reinforced by other research summaries (e.g., Moscicki, 1993; Thomas & Howell, 2001) as well as Eleanor’s reading of additional research studies not included in the systematic review (e.g., Laiho & Klippi, 2007). Thus, it appears to Eleanor

that many children who learn the treatment approaches described in the literature are able to improve their speech fluency in particular settings (such as the therapy room), though they tend to experience significant difficulties with generalization and maintenance in other settings (such as the classroom or at home). Eleanor recognizes that this is the exact situation that Emily is facing, for a review of the treatment strategies that Emily has learned in prior therapy reveals that most of them are based on modifications to speaking style, such as reductions in speech rate.

The results of Eleanor's review of the literature cause her significant concern, because it appears that the treatment that Emily has received previously may indeed have been based on the available literature. The treatment involved changes to speaking style (e.g., slower speech) aimed at improving fluency, and frequency of stuttering was taken as the primary metric of success. Moreover, Eleanor notes with disappointment that none of the reviewed studies provide information about improvements in children's communication skills, performance of daily activities, or

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**None of the reviewed studies provided information about how to improve children's communication skills or participation in educational and social activities**

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participation in educational and social endeavors, as described in IDEA and the ASHA scope of practice. She re-examines the inclusion criteria for the systematic review and confirms that the primary metric used for examining treatment outcomes in the vast majority of the studies was the

frequency of stuttering behaviors that were observed before, during, or after treatment. Of course, Eleanor recognizes that the amount of stuttering a speaker experiences forms an important part of the stuttering experience but she also knows that the speaker's experience of stuttering involves more than just speech behaviors (e.g., Yaruss & Quesal, 2004). Her careful reading of the systematic review reveals that the authors of that review did attempt to include studies reporting social, emotional, and cognitive results. The problem appears to be that such papers simply do not presently exist. Indeed, her own attempts to identify such studies during her online search, using terms such as "education" and "classroom," revealed only a small number of articles, and these were case reviews, not research studies.

Still, Eleanor needs to find a way to help Emily improve her communication and participation, so she decides to examine these case reviews, keeping in mind that

the results must be considered with caution. One such paper (Murphy, Yaruss, & Quesal, 2007), describes the use of cognitive restructuring and desensitization activities designed to help a school-age boy who stutters reduce his concerns about stuttering so he could communicate more freely at school and in social settings. The paper is just a case presentation, with no attempt to establish experimental control, though it does incorporate a variety of data-based techniques drawn from the cognitive psychology literature.

Of particular interest to Eleanor is the fact that the authors discuss exactly the types of difficulties that Emily is facing with her speech and communication. The boy described in the paper participated in speech therapy aimed at improving

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**Eleanor realizes that she cannot rely solely on the published research literature to address her clinical question, given that scant research literature is available on this topic**

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fluency but failed to generalize those strategies to new situations or maintain them over time. He reported knowing how to modify his speech but did not consistently use techniques outside of the therapy room. More importantly, he experienced significant difficulties with communication because of his negative reactions to stuttering. He reported feeling embarrassed by stuttering and concerned about how others viewed his speech. The article explains how clinicians can help children overcome these negative reactions by learning to accept moments of disfluency, to acknowledge stuttering more openly and freely, and to communicate effectively by reducing physical tension and struggle during both fluency and stuttered speech. Eleanor believes that Emily's participation in educational and social endeavors would be dramatically improved if she were able to achieve these goals. Therefore, even though the case report does not provide the type of "high quality evidence" that Eleanor would like to see, she reads the case report carefully, seeks out the references included in the paper, and contemplates incorporating some of the strategies described in the paper in the individualized treatment program she must develop to help Emily with her communication difficulties.

### *The Evidence-Based Decision*

Based on the results of the systematic review and her own evaluation of the literature, Eleanor realizes that she cannot rely on the published research literature alone to provide guidance about how to help Emily improve her communication and her ability to participate in daily activities. Still, she wants to ensure that she follows the

principles of EBP to the best of her ability. Fortunately, she recalls that ASHA's definition of EBP incorporates not only the available research literature, but also clinical expertise and the values and needs of the client. Thus, she decides to develop an individualized treatment plan that incorporates some strategies that have strong support in the research literature, as well as other strategies that are less clearly supported. She also draws upon her knowledge of Emily's prior treatment experiences, which already involved strategies for speaking more fluently, but which did not prevent the development of negative communication attitudes and speaking fears that limit her participation in class. In the end, Eleanor opts to reinforce selected speech modifications strategies, such as reduced speaking rate, to help Emily improve her fluency.

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**Evidence-based practice incorporates not only the research literature, but also clinical expertise and the values and needs of clients.**

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that this combination of approaches will help Emily achieve better "real-world" outcomes than she obtained in prior therapy. She recognizes that she is not using a purely "data-based" approach to selecting her treatment strategies, though she can see no other alternative, given the limited nature of the existing literature and the specific needs of the client with whom she is working.

### *Applying the Clinical Decision to Real-World Clinical Practice*

As Eleanor begins to use this integrated and individualized treatment program with her young client, she wants to document that the treatment is effective for achieving her stated goals of improving speech fluency and reducing the negative impact of stuttering on communication. Therefore, she decides to collect detailed information about Emily's fluency and communication abilities. Drawing upon her knowledge of the ASHA scope of practice, Eleanor endeavors to document: (a) Emily's impairment in body functions (her surface stuttering behaviors), (b) activity limitations (the difficulty she has in performing daily activities in the classroom and in other settings) and participation restrictions (the difficulty she has communicating with others), and (c) personal reactions and

environmental barriers (challenges associated with different speaking situations and the reactions of others). Of course, she would need to collect such data even if research studies were available that specifically addressed the population of interest and the specific goals and outcomes she hopes to achieve, for knowing that a treatment works with selected children in a published research study is not the same as knowing that the treatment works with a particular child on a clinician's caseload.

Fortunately, speech-language pathologists have a number of options for documenting children's speech fluency and communication skills. For example, they can assess the impairment of stuttering (i.e., the surface speech behaviors) through published tests (e.g., the Stuttering Severity Instrument-3; Riley, 1994) and informal frequency counts (Yaruss, 1998). They can assess activity limitation, participation restriction, and both personal and environmental factors using published tests (e.g., the Behavioral Assessment Battery [BAB; Brutton & Vanryckeghem, 2006] and the Overall Assessment of the Speaker's Experience of Stuttering – School-Age [OASES-S; Yaruss, Coleman, & Quesal, 2006]), and a variety of portfolio-based assessment techniques (e.g., Chmela & Reardon, 2001; Reardon-Reeves & Yaruss, 2004). Together, these measures provide clinicians with a comprehensive picture of a child's overall stuttering disorder, and this allows them to document the changes the child experiences throughout the course of treatment.

In this case, Eleanor begins by collecting *baseline* data prior to initiating her treatment program. The baseline data provide a reference point that can be used to reflect the child's experiences at the outset of treatment. Ideally, clinicians would collect an "extended" baseline – multiple measures made over time before treatment begins – to show that changes were not occurring prior to the time that treatment was implemented. Unfortunately, extended baselines can be difficult to collect in certain settings, such as the schools, that require a specified number of treatment sessions to be provided during a given time. (Multiple data collection sessions can also pose a problem when the clinician or agency charges for treatment session or when third party payment is required.) Still, by comparing data collected at the initial evaluation session with data collected at the baseline session, just before treatment begins, clinicians can evaluate whether the child was experiencing changes in speech behavior or communication difficulties before treatment. This is the course that Eleanor follows.

Throughout the course of treatment, Eleanor continues to document changes in Emily's fluency and communication

through the selective re-administration of key measures reflecting Emily's experience of stuttering. Because she cannot regularly administer all of the tests and measures completed at the diagnostic evaluation and at baseline, Eleanor applies measures focused on speech fluency (e.g., frequency counts) during those times in treatment when she is working on speaking skills and measures focused on communication and participation (e.g., portfolio-based assessments) during times when she is focusing on desensitization, cognitive restructuring, and acceptance. This allows Eleanor to target her data collection to the areas where she expects to see changes so she will have specific information about whether the strategies are achieving the desired goal. As she collects these data, she regularly examines the results of her analyses to ensure that her treatment is effective, and she adjusts her treatment strategies as necessary based on her results. Next, she identifies specific points in the therapy process where she will re-administer all measures to document ongoing changes that may occur in fluency or communication, regardless of what she is targeting in therapy at the time. In the school setting, an ideal time to do this is at the end of a term or marking period, or at the end of the academic year. Finally, Eleanor continues to check the research literature to see if new studies have been published that may help her refine her treatment. In this way, through her ongoing analysis of the literature and her regular attempts to evaluate data about the specific child with whom she is working, Eleanor is able to follow the principles of EBP in the treatment of this school-age child who stutters.

***Summary: Using Clinical Evidence to Supplement the Research Evidence***

The purpose of this *EBP Brief* was to provide clinicians with guidance about how to select a treatment approach for school-age children who stutter. The example described in this paper presented a situation in which the existing literature did not provide the specific results that the clinician wanted in order to justify the selection of a particular treatment approach. As a result, she needed to develop her own treatment approach, based in part on a review of the evidence-based literature and in part of her own reading of other peer-reviewed papers that addressed the needs of school-age children who stutter. In fact, clinicians should always collect their own data and evaluate the results of their treatment, even if the research literature contains studies that appear to

document exactly the type of treatment they wish to employ. The fact that a treatment program is supported by documentation with a particular set of participants does not mean that the treatment will necessarily work with other individuals. Therefore, the only way a clinician can know whether a treatment is effective is for the clinician to examine his/her own outcomes in a systematic and comprehensive fashion. It is the authors' hope that this *EBP Brief* will encourage clinicians to collect such documentation, in keeping with the guidelines of the ASHA Scope of Practice, the requirements of IDEA, and the principles of EBP.

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