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Using Evidence To Guide Decision Making in the Educational Setting

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The goal of evidence-based practice is to integrate the best research evidence with clinical expertise and client values in order to guide decisions regarding client care (Sackett, Richardson, Rosenberg, & Haynes, 2000). Most occupational therapists acknowledge the importance of integrating evidence into their daily practice, and many have taken steps to become more familiar with the process of evidence-based practice. However, the actual application or integration of evidence into practice also is a process. The evidence from research studies alone should not be the deciding factor but, rather, should be viewed as a piece of the puzzle to assist the therapist in making better decisions. Therapists also should use their professional expertise and experience along with the unique needs of the client, setting, and situation (Sackett et al., 2000). The process of putting those pieces together poses a unique challenge to therapists who work in the educational setting.

This article describes the process and impetus for using evidence in school-based practice and focuses on fulfilling the challenge of integrating evidence into the intervention plan (American Occupational Therapy Association [AOTA], 2002). The plan includes measurable goals; intervention approaches based on theory and evidence; and mechanisms for service delivery, including types of interventions. This article also discusses key questions an occupational therapist should consider in order to make informed decisions about the use of evidence.

Five-Step Process for Evidence-Based Practice

The process of integrating evidence into occupational therapy practice in the school setting includes the following five steps:

1. *Formulate a clinically relevant question:* Devoting some thought to the development of a question that is both relevant and answerable is important. This thought process allows you to identify the specific population, intervention, and outcome in which you are interested. Formulating a solid question also helps with developing a list of key words to use in the literature search. Listing alternative key words also helps in finding more research studies. For example, alternative key words to *children* might be *pediatrics* and *students*. The key words determine what and how much information you will find. Online tutorials, such as that found at the Centre for Evidence-Based Medicine (www.cebm.net/searching), can be very helpful in choosing appropriate key words or narrowing or expanding a search.
2. *Gather current published evidence that might answer the question:* Several sources exist online for searching, and adequate search results usually can be found without subscribing to paid databases (see Internet Resources at the end of this article). In some instances, you can find a manageable number of research studies simply by using one word or phrase, such as *weighted vest*. However, if your search results in more than 30 or 40 studies, you probably will want to go back and narrow your search by adding "limiters." For *weighted vest*, you might add *sensory*, *children*, or *attention* to your search terms. Further, you could limit results to those articles published in the past 5 years.
3. *Evaluate the gathered evidence to determine the "best" evidence for answering the question:* You must determine the research study's findings and examine the quality of the study. Draw your own conclusions about the study's merits after reading it all the way through, not by skipping to the Discussion or Conclusion sections. Do not assume that all published research studies are grounded in sound methodology or draw logical, unbiased conclusions based on their results. Again, the Centre for Evidence-Based Medicine is a helpful resource for descriptions of research design, levels of evidence, and statistical measures.
4. *Communicate with clients and colleagues about the evidence as evaluation and intervention decisions are being made:* It is likely that the evidence you find will not exactly match your specific situation. Make decisions about the applicability of the evidence and whether it is appropriate and feasible for the client's specific situation.
5. *Evaluate the outcome of chosen evidence-based evaluation or intervention procedures as they are implemented and revise as appropriate:* It is not enough to assume that something will be effective simply because the evidence has found it so. You must be involved in the process of routinely and systematically collecting data, examining the data, and using the data to make decisions about the effectiveness of an intervention in achieving the targeted outcomes (Tickle-Degnen, 2000).

Impetus for Evidence-Based Practice

Recent changes in federal law have mandated that interventions and programs used in public schools be grounded in evidence. The No Child Left Behind Act of 2001 (NCLB [2002]; Public Law 107–110) has stated that school personnel will "use effective methods and instructional strategies that are based on scientifically

based research" [Title 1, Section 1114(b)(1)(B)(ii)]. According to the Individuals with Disabilities Education Improvement Act of 2004 (IDEIA; Public Law 108–446), the student's individualized education program (IEP) will provide "a statement of the special education and related services and supplementary aids and services, based on peer-reviewed research to the extent practicable" [Section 614(d)(1)(A)(i)(IV)] and that funding will be made available to help "identify scientifically based related services and interventions that promote participation and progress in the general education curriculum and general education settings" [Title II, Section 177(a)(4)].

Considerations for Integrating Evidence in the Educational Setting

The *Occupational Therapy Practice Framework: Domain and Process* (Framework; AOTA, 2002) identifies education as one of the key areas of occupation. According to the Framework, education addresses the "activities needed for being a student and participating in a learning environment" (p. 620). "In the schools, occupational therapists use their unique expertise to help children to be prepared for and perform important learning and school-related activities and to fulfill their role as students" (AOTA, 2003, p. 1). The occupational therapist and occupational therapy assistant are part of the collaborative educational team that implements the IEP and works with team members to provide educationally relevant services to students with disabilities and to facilitate participation and learning in the general education curriculum (Knippenberg & Hanft, 2004).

The Framework guides occupational therapists and occupational therapy assistants to consider a range of supports and services by addressing child, task or activity, and environmental or context components to help students reach their goals. Although the Framework guides occupational therapy practice, therapists providing services in the schools must reconcile Framework terminology with the language typically used in educational settings. For example, the Framework refers to the things that students need to do as *activities*; the educational community more frequently refers to these as *tasks*. As IDEIA and NCLB intend, occupational therapists contribute to educational outcomes in the least restrictive environment by assisting to modify tasks, adapt materials and environments, and support educational staff (Knippenberg & Hanft, 2004). Service delivery should be based on collaboration with the student's educational team to ensure that learning is generalized across all school activities and settings (Swinth & Hanft, 2002). Integrating the best evidence available with the therapist's professional expertise and the unique needs of the student, educational team, and setting (as in Step 4) calls on the therapist to consider several key questions relevant to the educational setting.

Are the participants in the studies enough like the student you are trying to assist?

Because most interventions do not work equally well for everyone, it is important to consider under what conditions the intervention is found to work best and under what conditions the intervention is found not to work or even to be harmful. When considering the participants in the studies, think about their ages, interests, conditions, socioeconomic status, and other factors that may be relevant. How similar are those participants to your students? You may not find that the participants are identical to your population, so you must decide whether they are enough alike that the intervention is likely to have the same effect.

Does the intervention directly support a student's education?

School-based occupational therapists must provide services to students that are educationally relevant and facilitate participation and learning in the general education curriculum. Some interventions may be effective but do not support the student's education. In other words, some interventions do not help the student do the things he or she needs and wants to do at school. These interventions are most appropriate for use in a clinic- or home-based therapy program.

Can the intervention be integrated into the student's daily routine?

Supporting a student's education means allowing him or her to be present in the classroom. Removing a student from instruction as well as from his or her peers makes it more difficult for the student to make progress academically and socially. Occupational therapy interventions used in the school setting should be those that allow the student to remain in the least restrictive environment. Examples of these types of interventions might include activity or environmental modifications, adaptive equipment, assistive technology, and training for educational staff.

Is the intervention the most feasible in terms of cost, time, training, and space?

As therapists working on behalf of school districts, we are responsible for evaluating not only the effectiveness of an intervention, but also the prudent use of the district's resources, such as funds and space. Although we should never deny assistance to a student who needs it, we have a responsibility to consider not only whether an intervention is effective, but also whether a more efficient intervention exists that would be equally effective.

Is the intervention consistent with the values of the student, teacher, staff, and family?

As unique individuals, students have different personalities, living conditions, and values or cultural beliefs that may affect their acceptance of an intervention. Flexibility, creativity, and resourcefulness are the keys to finding interventions that work for everyone involved.

Is there any risk to the student or others? Do risks outweigh the benefits?

It is not sufficient to determine that an intervention is likely to be effective. It is also important to be aware of any risks the intervention might pose to a student, peer, or educational staff member. These potential risks should be weighed heavily against the benefits; and the therapist should determine, with appropriate input from parents and teachers, whether to proceed. Use of an intervention with students with certain conditions, such as degenerative diseases, also may be contraindicated.

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Case Study: The Evidence on Pencil Grasp

José is a 7-year-old who attends first grade general education classes. He has a learning disability that affects written expression. José's IEP states that he will "write a seven-word sentence legibly in four out of five trials." His teacher is very concerned about the "strange" way José holds his pencil and wants the occupational therapist to "fix it so that José can write legibly." The occupational therapist, Marsha, has evaluated José's needs and identified that he has difficulty with letter formations, spacing, and placement on the paper. Marsha noted that José appears to lack clear hand preference and holds his pencil using the tips of his first four fingers. She also notes that he hyperextends his thumb distal interphalangeal joint. Marsha knows that changing a child's pencil grasp is a standard practice. She wonders whether changing José's grasp may help him to improve his handwriting legibility. Because she is extremely busy, her first inclination is to use trial and error to determine whether this strategy will work. However, Martha realizes that doing this may potentially waste the school district's money and prolong José's and his teacher's frustration. She wants to help him as quickly and efficiently as possible, so she decides to do an evidence search.

Martha's local public library has free online access to a large number of databases, including ERIC and MEDLINE, so she begins her search there. Her clinically relevant question is: Does pencil grasp affect legibility in elementary-age students? Using *pencil grasp* and *pencil grip* as her search terms in the ERIC database, Marsha finds four quantitative research studies done in the past 15 years that evaluated the relationship between pencil grasp and handwriting.

Marsha first reads and analyzes Schneck (1991), which found that 60 first graders with poor handwriting demonstrated a lower grip score on a five-point pencil-grip scale than children without poor handwriting. However, additional data suggested that poor proprioceptive-kinesthetic feedback and lack of hand preference may cause both poor handwriting and a lower pencil-grip score. Thus, children with atypical grips may need to be assessed and treated for those issues instead of simply changing their grip. Next, Marsha reads and analyzes Burton and Dancisak (2000), which found that in 60 3- to 5-year-olds, there was no difference in legibility between the lateral tripod grasp and the dynamic tripod grasp. A study of 46 fourth graders by Dennis and Swinth (2001) found that pencil grasp did not affect overall legibility on short or long writing activities. Next, she analyzes Koziatek and Powell (2003), which found that in 101 students, lateral quadrupod and four-finger pencil grips were as functional as the dynamic tripod in terms of legibility and speed for 9- and 10-year-olds. Finally, Martha consults the University of Puget Sound's Evidence-Based Symposia and finds a research poster that compared the evidence on using dynamic tripod grasp and atypical grasp patterns (Cooley, 2004). Here, she found additional research articles to review and read a summary of the evidence as well as implications and recommendations for best practice.

After carefully reviewing these studies and Cooley's (2004) evidence review, Marsha determines that the dynamic tripod grasp is not the only functional pencil grasp used and that other grasps can be used functionally. She also comes to the conclusion that grasp may not have a significant effect on handwriting performance. Marsha then consults with her mentor who is a more experienced occupational therapist. In her mentor's experience, the longer a child has been writing, the more difficult and stressful it is to change his or her pencil grasp. Marsha also notes José's lack of motivation to change his handwriting. Based on a combination of published research and professional expertise, Marsha decides that José's grasp is not likely to be causing his handwriting difficulties and that it may well help him compensate for the hyperextension of his thumb. Instead of trying to change José's pencil grasp, Marsha decides to do another evidence search, this time focusing on development of hand preference.

In the meantime, Martha meets with José's teacher and explains the evidence she found on pencil grasp. She and the teacher discuss possible ways to motivate José to improve his legibility as well as to introduce adaptive strategies in the classroom, such as dark-lined paper and a spacing aid to support José's IEP goal. Marsha is sensitive to the teacher's, parent's, and students' acceptance of the various strategies discussed and discards those that would make anyone uncomfortable. The strategies chosen will be ones that are acceptable to everyone involved; can be integrated into José's daily school routine with minimal time, training, and expense; and carry little or no risk to him. Marsha then works with José's teacher to plan a data collection program so that José's progress while using the strategies can be measured and evaluated objectively.

Conclusion

Through a collaborative process, occupational therapists are able to incorporate the evidence they find into their plan of care with students. Using the key questions for integrating evidence into school-based practice, therapists can be assured that their interventions align with the goals of occupational therapy within the educational setting and assist students to participate and learn. ■

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Internet Resources on Evidence-Based Practice

Evidence-Based Practice Resources	www.aota.org (members only)
Center for Evidence-Based Medicine	www.cebm.net
Freemedicaljournals.com	www.freemedicaljournals.com
National Guideline Clearinghouse	www.guideline.gov
OTseeker	www.otseeker.com
PEDro-Physiotherapy Evidence Database	www.pedro.fhs.usyd.edu.au/index.html
Promising Practices Network	www.promisingpractices.net
PubMed/MEDLINE	www.ncbi.nlm.nih.gov
Social Programs That Work	ww.evidencebasedprograms.org
University of Puget Sound Occupational Therapy Department's Evidence Symposium	www.ups.edu/x3676.xml
What Works Briefs	www.csefel.uiuc.edu/whatworks.html
What Works Clearinghouse—check out their new Help Desk!	www.w-w-c.org
National Information Center for Children and Youth with Disabilities Research Center	http://research.nichcy.org

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