

Clinical Forum

Guiding Principles and Clinical Applications for Speech-Language Pathology Practice in Early Intervention

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Purpose: This article describes guiding principles in early intervention (EI) and demonstrates how speech-language pathologists (SLPs) can apply these principles to best serve infants and toddlers with communication and related problems and their families.

Method: Four principles guide the implementation of speech-language pathology services. EI services are services that are (a) family centered and culturally and linguistically responsive; (b) developmentally supportive, promoting children's participation in their natural environments; (c) comprehensive, coordinated, and team based; and (d) based on the highest quality evidence available. Actual clinical scenarios are presented to illustrate each principle.

Results: The four principles provide a framework for the wide range of roles and responsibilities assumed by SLPs in EI:

(a) screening/evaluation/assessment, (b) goal setting and intervention, (c) consultation with and education for team members, (d) service coordination, (e) transition planning, and (f) advocacy.

Conclusion: It is critical that families of infants and toddlers who are at risk for, or who have been diagnosed with, communication disorders receive all necessary services and supports. EI services should be tailored to the individual and the changing needs, preferences, and priorities of each family. The earlier services are provided, the more likely is the child's chance to develop effective communication.

Key Words: early intervention, speech-language pathology, family-centered care

Early intervention (EI) in speech-language pathology refers to a broad range of services that are provided to infants and toddlers (birth to 3 years) who have, or are at risk for, communication, speech, language, hearing, feeding, swallowing, and/or emergent literacy problems. Not only is it critical that high-risk infants and toddlers receive all necessary services and supports, but the earlier services are provided, the more likely are the children's chances for developing effective communication and attaining successful language and learning outcomes (Guralnick, 2011;

National Research Council & Institute of Medicine, 2000). EI services include (a) screening/evaluation/assessment; (b) goal setting and intervention; (c) consultation with and education for team members, including families and other professionals; (d) service coordination; (e) transition planning; and (f) advocacy (American Speech-Language-Hearing Association [ASHA], 2008c). Speech-language pathologists (SLPs) have a central role in providing EI services and may function independently or as part of a team. SLPs also have a role in preventing communication disorders and a responsibility to advance the EI knowledge base through professional development and by conducting and disseminating research.

According to ASHA (2008a, 2008b, 2008c, 2008d), four principles guide the implementation of EI services:

- Services are family centered and culturally and linguistically responsive.
- Services are developmentally supportive and promote children's participation in their natural environments.
- Services are comprehensive, coordinated, and team based.

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Editor: Kenn Apel

Associate Editor: Donna Boudreau

Received November 16, 2009

Revision received April 16, 2010

Accepted September 18, 2010

DOI: 10.1044/0161-1461(2010/09-0079)

- Services are based on the highest quality evidence available.

Although no single set of practices is appropriate for all children and families, these guiding principles can be used to inform decisions about EI services.

This article begins with a brief overview of the federal legislation that governs the provision of communication-related EI services. It then describes each of the guiding principles and demonstrates how these principles can best serve infants and toddlers with early communication and related problems. The article also discusses the importance of individualization in EI services based on the specific and changing needs of each family and child. The four principles should be implemented with attention to these individual family and child needs, and progress should be monitored and adaptations made when warranted. Real-life scenarios and clinical applications are provided following each principle. The scenarios are based on the experiences of practicing SLPs and other providers of EI services.

Overview of Federal Legislation for EI Services

The provision of EI services in the United States is guided by Part C (Infants and Toddlers Program) of the Individuals with Disabilities Education Improvement Act (IDEA) of 2004. This federal law serves children with disabilities and significant developmental delays from birth through age 2 years (Part C services may be extended to age 6, but not all states have adopted this practice). The primary focus of IDEA Part C is on the family. EI services are designed to support the family's ability to meet the developmental needs of its infant or toddler. Requirements for compliance include the right to a multidisciplinary evaluation to determine the child's eligibility for services. Further, families must be involved in the process to develop an individualized family service plan (IFSP). The IFSP documents the services to be provided and the desired outcomes.

The type, frequency, location, duration, and providers of the services are determined through the IFSP process. According to IDEA, EI services are to be provided in natural environments, which may include the child's home or other settings where the child participates. Other components of the law include the requirement for service coordination and transition planning. A service coordinator works with the family to assist with the IFSP process and other aspects of EI service. The service coordinator also is responsible for convening a transition conference before the child turns 3 years old. The transition team's task is to help the family and child move to general education or special education school services, which is Part B of IDEA. Enrollment in the EI system is voluntary, and the eligibility definitions and implementation vary greatly from state to state. Families need to become familiar with their own state's policies, procedures, and resources. The four EI principles and the

IDEA 2004 Part C requirements guide SLPs to collaborate with families to provide comprehensive EI services and supports.

Principle 1. Services Are Family Centered and Culturally and Linguistically Responsive

Family-centered services. EI services are designed to achieve successful child and family outcomes. With a family-centered approach, the family, rather than the individual child, is often the primary recipient of services (Bruder, 2001; Dunst, 2000). Family-centered services are based on a set of beliefs and values that support family involvement in the child's development and promote positive and successful adult-child and child-child communication interactions (Boone & Crais, 1999; Dunst, 2001; IDEA, 2004; Polmanteer & Turbiville, 2000). Federal policies (IDEA, 2004) and more than 2 decades of literature have recognized that traditional models of service (i.e., where child/client is the primary recipient of services) are not always appropriate for infants and toddlers who have been diagnosed with, or are at risk for, disabilities because of the central role families play in all aspects of EI services (e.g., Guralnick, 2001, 2005, 2011; Sandall, Hemmeter, Smith, & McLean, 2005; Shonkoff & Meisels, 2000). In addition, families/caregivers favor services that are consistent with these guiding principles compared to traditional service models (Dinnebeil, Hale, & Rule, 1996; Dunst, 2000, 2002, 2004; Dunst & Trivette, 1997; Sandall et al., 2005; Summers, Hoffman, Marquis, Turnbull, & Poston, 2005; Trivette & Dunst, 2005).

A key component of EI is the provision of services that are individualized based on the concerns, preferences, priorities, and resources of each family and child. Respect and responsivity are central to a family-centered philosophy (Dinnebeil et al., 1996; R. Paul, 2007; Roth & Worthington, 2005). Such an approach also acknowledges the right of families to make decisions based on what is in the child's best interest (Dunst, Trivette, Starnes, Hamby, & Gordon, 1993; Summers et al., 2005). As members of the EI team, families have an opportunity to take an active role in the decision-making process concerning all aspects of service delivery, including screening/evaluation/assessment, goal setting, intervention, and transition planning.

Individual families, however, vary considerably in their preferred levels and types of involvement (Crais, Poston Roy, & Free, 2006). A family-centered service approach should provide a continuum of options based on individual preferences, needs, and resources. Some families opt to be the key decision makers in directing or guiding the EI process. In these cases, the SLP and other service providers serve mainly as consultants to the family. Other families may take a more indirect role and prefer that SLPs and other specialists provide more direct services. The degree of

involvement is dynamic, and families' preferences may change over time. This likelihood underscores the need for SLPs to monitor family and child outcomes and adapt services and service delivery models on an individual and ongoing basis.

Culturally and linguistically responsive services. EI services are affected by the cultural and linguistic backgrounds of the family, child, and professionals. Like all clinical activities, EI services are inherently culture bound because they reflect the beliefs, values, and interaction styles of a social group (Battle, 2002; Johnston & Rogers, 2001; Kohnert, Kennedy, Glaze, Kan, & Carney, 2003). SLPs need to recognize their own as well as the family's cultural perspective and how these factors might influence their perceptions of and interactions with others. However, people within any culture represent a range of perspectives and cannot be categorized on the basis of alignment with a particular cultural group. Factors such as beliefs about child rearing, discipline, authority roles, and styles of communication, as well as views on disability and past experiences with health care professionals, can influence the family's interactions and the decision-making process. Areas of cross-cultural variations frequently encountered by SLPs are

- Values about learning: Individuals within some cultures may emphasize independent learning by the child, whereas other individuals might focus on what a learner can accomplish in collaboration with others.
- Beliefs and perception about adult-child roles in the family: Adults from a similar cultural background might assume a directive child rearing and communication style, whereas individuals from a different culture may view the adult's role with children as interactive and reciprocal.
- Expectations for child behavior at different developmental levels: The age at which children are expected to demonstrate certain milestones (e.g., language, motor) varies across cultures (Anderson, 1991; Barrera & Corso, 2002; Erickson & Kurz-Riemer, 1999; Roth & Worthington, 2005).
- Family perceptions and attitudes toward a "disability": The degree of acceptance based on cultural norms may determine whether EI services are sought for a child, the degree to which the family participates in those services, and the family's priorities and expectations for the child (Hanson, 1992; Hanson & Lynch, 2004).

With the changing demographics and increasing socio-cultural heterogeneity of the U.S. population (e.g., language, culture, race, gender, ethnicity, lifestyle, socioeconomic status, family constellation, geography), SLPs must be informed about and sensitive to how these differences can influence family/provider relationships and communication. Recommended practices as well as EI policy (ASHA, 2004; IDEA, 2004; National Association for the Education of

Young Children [NAEYC], 2005) emphasize the importance of using EI materials and procedures that are culturally and linguistically appropriate and tailored to the needs of individual children and their families. In order for EI services to be effective, they should occur in a language or communication mode that is familiar to the family. This provision offers support for the child's home language, which is important for children with communication delays (Kohnert, 2008; Kohnert, Yim, Nett, Kan, & Duran, 2005). Close work with interpreters and translators is often necessary for the provision of center- and home-based services (Langdon & Cheng, 2002; Langdon & Quintanar-Sarellana, 2003). Some EI programs use cultural guides or cultural-linguistic mediators to advance effective and satisfying communication between professionals and families (Barrera, 2000; Lynch & Hanson, 2004; Moore & Perez-Mendez, 2006). A cultural-linguistic mediator is knowledgeable about the family's culture and/or linguistic community. The mediator provides information about the new country and culture and facilitates communication between families and EI agencies and providers. The service provider (e.g., SLP) continues to be responsible for familiarizing families with available services and supports (ASHA, 2004).

Wing et al. (2007) proposed alternative EI strategies when the SLP and family do not share the same cultural background, including involving siblings or others, using more structured tasks or group settings for language treatment, and using direct training techniques that are consistent with the family's culture. These authors concluded that "when standard practices are inconsistent with the family's cultural values and behaviors, and therefore unnatural for the child socialized in this environment, alternative strategies must be considered" (Wing et al., 2007, p. 25).

The following two scenarios illustrate the application of this principle pertaining to family-centered care and culturally and linguistically responsive services. The first scenario shows how families can be directly involved in communication and feeding assessment, with the degree of involvement based on the family's preference. The second scenario demonstrates how attention to cultural differences can enhance services for families.

Family participation in the assessment process. Ricky, an 18-month-old boy, demonstrated delays in multiple developmental areas including speech, language, and feeding. He had a preterm delivery at 20 weeks gestation, with a birth weight of 1.5 lbs. Ricky received care in the neonatal intensive care unit (NICU) for 6 weeks before being transferred to the transitional intensive care unit.

Clinical questions. What roles should the SLP and parents play in the assessment process? What are the concerns unique to this family and child that should be addressed in a comprehensive assessment?

Clinical strategy. The SLP and parents discussed the optimal ways to assess Ricky's speech, language, and feeding behaviors. They mutually agreed that the parents would

interact directly with Ricky during typical routines at home while the SLP observed, recorded information, and coached the parents during the assessment process. The SLP prepared a set of questions to help the parents create a profile of Ricky's communication and feeding strengths and needs. Some of the questions relating to communication and feeding included: How does Ricky let you know what he wants? What words and gestures does he use? What kinds of directions does he follow? How does he get your attention? Does he respond to his name? Does he like when you read to him? Is he a picky eater and what makes you say that?

After the SLP and parents discussed Ricky's profile, the SLP asked the parents to gather some common objects and toys (e.g., big and little doll, baby bottle, brush, cups, spoons, toy car, small ball, and some blocks). The SLP and parents observed Ricky playing with the toys, after which the SLP prompted the parents to ask Ricky to bring some toys to the table (e.g., book, truck, ball). The SLP observed Ricky's responses and watched how the parents elicited comments from him. The SLP continued to prompt the parents to ask Ricky questions and give him directions (e.g., "Ask him to bring his favorite toys to the room, such as 'Get your ball.'"), and observed his responses. The SLP wanted to determine how Ricky interacted with his parents and objects in the environment: What does Ricky do spontaneously with an array of objects? How does he respond to parent requests? Does he depend on parent gestures paired with verbal requests, or does he respond based solely on verbal cues? What verbal requests does Ricky use? What gestures does Ricky use?

To assess Ricky's feeding and swallowing needs, the SLP asked the parents to obtain a variety of foods of different textures, colors, and temperatures, as well as Ricky's preferred and nonpreferred foods and drinks. The parents then presented a small amount of each food to Ricky one at a time. The parents also included typical feeding utensils and Ricky's seating equipment. The SLP watched and discussed how Ricky grasped food, how he chewed and swallowed the food, and how well he retained liquids and foods. The SLP observed whether there was any choking during feeding and noted Ricky's level of independence for self-feeding. All of these data were consolidated and used to inform decision making by the SLP and Ricky's family.

This scenario demonstrates a family-centered approach to an EI assessment. In this scenario, the family was involved right from the start; the focus of the assessment was primarily on the parents and their interactions with their child. The assessment provided the SLP with information about what the child was doing, how the parents elicited the child's behaviors and how they communicated with their child, and the child's responses. In this scenario, the parents were actively involved in guided parent-child interactions. The SLP may need to interact more directly with the child with

some families or may want to involve other caregivers and siblings in the assessment process.

Following the assessment and data interpretation, the SLP and Ricky's parents jointly identified target intervention goals based on the identified communication and feeding priorities and concerns. The parents, with ongoing consultation with the SLP, learned ways to interact more effectively with Ricky to increase his use of functional language in everyday situations. They also were able to help Ricky develop more mature feeding skills. Ricky's family wanted to meet other families who had children with similar needs. The SLP was familiar with community resources and helped Ricky's parents connect with another family who eventually became a mentor and support system to Ricky's family.

Being responsive to family needs and cultural differences. Rivka, age 2;10 (years;months), was admitted as an inpatient to a pediatric ward due to severe malnutrition. A team consisting of Rivka's parents and an SLP, occupational therapist, nutritionist, developmental psychologist, and developmental pediatrician diagnosed Rivka with failure to thrive, a feeding disorder, an intellectual disability, a visual impairment, language functioning at the 12-month developmental level, and fine motor skills at the 18-month developmental level. Helping Rivka gain weight was the team's first priority. The family lived approximately 100 miles from the hospital. They were Hassidic Jews and kept strictly kosher. Rivka's mother, who was 7 months pregnant, was bringing food and all feeding utensils to the hospital on a daily basis and staying for all meals and snacks. She had to leave a younger child home with a sitter, which added an expensive burden for the family.

Clinical questions. Does Rivka's mother have to be present for all meals and snacks? Can Rivka eat food supplied by the hospital? Can Rivka use utensils supplied by the hospital? What would happen to Rivka's feeding plan if a sitter could not come on a particular day and Rivka's mother had to stay home?

Clinical strategy. The parents asked that the SLP communicate directly with their rabbi. The SLP read about Jewish dietary laws. During a phone conversation with the mother and rabbi, the SLP explained Rivka's nutritional needs and the goals and challenges of her feeding program. The parents then privately discussed their concerns with their rabbi and whether the medical needs were great enough to permit the child to eat nonkosher food temporarily and use hospital utensils until she made the necessary weight gain for hospital release. The rabbi agreed that the religious rules could be waived temporarily until Rivka gained the necessary weight. Rivka's mother continued to visit the hospital on a daily basis by choice and participated in the treatment for one meal each day. Rivka gained 8 lbs. during 3 weeks of treatment. The SLP's attention to the dietary laws of the family and her commitment to learn about the family's religious and cultural differences, as well as to communicate on the family's behalf, eased the family's burden and helped the child thrive. The

SLP, who served as the service coordinator on the team, worked with the family to arrange home-based services related to nutrition, swallowing, self-help skills, and communication. She also provided contacts for local parent support groups within the Jewish community. Consideration of the needs, values, and preferences of the family—one of the components of evidence-based practice (ASHA, 2005)—contributed to the quality of care in this scenario.

Principle 2. Services Are Developmentally Supportive and Promote Children’s Participation in Their Natural Environments

Developmentally supportive services. Planning and implementation of EI services are based on what is known about child development across domains and the interrelationships among developmental areas (IDEA, 2004; NAEYC, 2005; Sandall et al., 2005). With respect to communication, the foundation of effective EI services includes an SLP’s knowledge of the typical course of communication, speech, language, and emergent literacy development as well as appreciation of individual differences and communication styles. This knowledge base also includes keen awareness of the pivotal roles of quality adult–child interactions and variations in what constitutes nurturing home language environments (Apel, 1999; Leonard, 1998; R. Paul, 2007). With this knowledge, SLPs can apply developmentally supportive EI practices that are geared to the family and to the child’s age, cognitive level, learning style, strengths, and interests (Bredekamp & Copple, 1997; Roth & Baden, 2001; Sandall et al., 2005). Developmentally supportive services are based on the needs of each family and a clear understanding of each child’s physiological, behavioral, and developmental responsiveness to his or her environment.

Participation in natural environments. Effective EI services occur in natural contexts, or the variety of settings within which young children learn and grow. Such contexts include situations or events involving a child’s daily communication partners and the family as a unit, as well as consistent opportunities for the child to engage in interactive communication and social routines/activities (Bredekamp & Copple, 1997; Roth & Baden, 2001; Sandall et al., 2005; Wing et al., 2007). Natural learning contexts can optimize young children’s acquisition of communication skills and promote transfer of newly learned skills to their everyday contexts (Bruder, 1998; Roper & Dunst, 2003). Natural environments also encourage children’s independent participation in communication situations.

Federal guidelines require that to the extent possible, EI services be offered in natural environments: “the home, and community settings in which children without disabilities participate” (IDEA, 2004, § 634(4) (G)). Thus, natural environments are not defined solely by location and may include a child’s home, other family members’ homes, early care and education programs, and playground or playgroup,

as well as other community contexts (Dunst et al., 2001; Dunst, Hamby, Trivette, Raab, & Bruder, 2000).

Because all phases of the EI process are intended to occur in the natural environment, SLPs must gain familiarity with the context of a family’s daily routines and interests. Common family activities may include interactive play, book sharing, feeding, dressing, and other routines that occur repeatedly with family members, family friends, and other regular caregivers and peers. In assessment, SLPs will observe adult–child and child–child communication patterns in typical daily activities. For intervention, strategies can be embedded throughout the child’s day across multiple settings and interaction partners to increase the frequency of a child’s functional communication behaviors and reinforce positive and responsive caregiver–child interactions (Bernheimer & Weismer, 2007; Cripe & Venn, 1997; Dunst et al., 2000).

Providing services within a natural environment may not always mean working with the parents in the child’s home. Although family-centered services often are considered to be synonymous with parent involvement, some parents may not be comfortable, willing, or able to be active team members in their child’s treatment. In these situations, communication partners and settings other than the home may be more facilitative contexts for EI services. The following two scenarios illustrate the principle of providing developmentally supportive services and promoting involvement in natural environments. The first scenario shows how services for feeding, swallowing, and communication can be provided in a way that enhances a child’s growth and development in a NICU, hospital, and at home. The second shows the importance of selecting multiple natural environments for service delivery based on family needs and preferences.

Developmentally supportive care for feeding and swallowing. Sara, now 10 months, was born at 20 weeks gestation. She was the smallest baby who ever survived at her hospital, weighing only 394 grams (14 ounces) and measuring only 11 inches in length. She spent 3 months in the NICU and then 3 months in the local children’s hospital. Sara was challenged by a host of medical problems and needed help to breathe, eat, sleep, and move. Her parents were grateful that their daughter was alive, but were overwhelmed by the gravity of the situation and felt barraged by all the medical jargon used by the doctors, nurses, and therapists. Although Sara needed tube feeding, she was still stimulated to suck on a pacifier and soon was transitioned to a bottle. Sara’s mother tried to come to the hospital after work to feed her, but it was not always possible. That meant that different nurses and aides were feeding Sara. Sara’s mother was concerned about the number of different caregivers involved because they held Sara, fed her, and responded to her in different ways. In the beginning, Sara was losing instead of gaining weight.

Clinical questions. How can consistency of care be ensured across service providers? Should one of the parents come to the hospital every day to feed Sara?

Clinical strategy. Sara's parents requested a team meeting to discuss their concerns about Sara's weight loss and the inconsistency of her care. The team included the parents, SLP, pediatrician, head nurse, and occupational therapist. The parents conveyed the need for clear communication, coordination of care, and a more limited number of trained caregivers. The team worked closely to create a feeding plan and train selected caregivers on its use. The training helped each caregiver know how to respond to questions such as: How can I get Sara to suck? Which nipple should I use on the bottle? How much rest time does she need between sucking and swallowing? How should I talk to her? How should I hold her? How long should I feed her? Sara's mother showed other team members how she positioned Sara for feeding and urged consistency in the way Sara was handled and fed. The SLP wrote out the instructions and posted them on the incubator for all caregivers to follow. The different team members rotated throughout the week monitoring feedings, assisting when needed, and noting comments about Sara's feeding behaviors. Within several days of starting the feeding program, Sara became calmer and more organized during feeding and began to gain weight. By the time she went home, Sara was at the 10th percentiles for height and weight.

Selecting natural environments. Lisa, age 2;4, attended a publicly supported community-based preschool program. Lisa's grandparents were her primary caregivers, and they were becoming increasingly concerned about the fact that Lisa was not talking, although she seemed to understand what they said. The teacher also was concerned. Lisa's grandmother requested an evaluation through the state's Infant and Toddler program. The grandparents participated on the assessment team, along with an SLP, audiologist, developmental psychologist, and the preschool teacher. The assessment confirmed Lisa's limited expressive abilities and revealed no hearing loss and seemingly intact receptive language and nonverbal cognitive abilities. The team concurred with the need for services in a natural environment to support Lisa's grandparents in enhancing Lisa's expressive language skills. Lisa's grandparents were not sure they wanted services in their home. They thought it would be easier for them if an SLP went to the school.

Clinical questions. Where should services be provided? Should Lisa continue to go to the preschool? Should services be extended to other community settings?

Clinical strategy. After talking to other team members, Lisa's grandparents thought that home-based services would provide a good opportunity for them to learn to enhance Lisa's communication skills under authentic circumstances, but they still wanted Lisa to continue to attend her preschool program. They needed the respite, and they felt that the teacher could support and facilitate the team goals in class. The SLP arranged for weekly home visits to work directly with Lisa's grandparents. The SLP demonstrated ways to elicit Lisa's use of signs, gestures, and vocalizations at home. Because Lisa was a relatively reticent communicator, the

SLP also demonstrated cues to encourage Lisa's initiation of signs (e.g., more, open). The SLP also modeled techniques for attracting and sustaining Lisa's attention to speech by using exaggerated articulation; varying intensity, stress, and intonation patterns; pairing gestures/signs with vocalizations; and using a wide range of facial expressions. The grandparents welcomed the SLP's suggestions and feedback. The grandparents kept a daily chart of specific communication behaviors they observed at home. The SLP used this information to track Lisa's progress and suggest programmatic changes as needed. The SLP also worked with Lisa's grandparents to foster communication interactions with other people and in other settings, such as the local park, ice cream shop, and grocery store. The provision of services at home, in different community settings, and supplemented in the preschool setting worked well for Lisa's family.

Principle 3. Services Are Comprehensive, Coordinated, and Team Based

Comprehensive services. Because all domains of development are highly interdependent during early childhood, a comprehensive approach to EI services is needed. Some infants and toddlers display severe involvement across multiple developmental areas (e.g., communication, social-emotional, cognitive, motor). Other children demonstrate milder disabilities, may exhibit a disability in one primary area, or may be at risk for a disability (e.g., low birth weight). Despite the nature and severity of deficits, children and families warrant comprehensive service provision, including service coordination and access to all needed supports and resources.

Coordinated services. Effective service coordination necessitates the clearly articulated integration of services (Sandall et al., 2005) and is a fundamental element of "best practices" in EI. Part C of IDEA 2004 mandates that members of the IFSP team coordinate their approaches, consult with one another, and recognize that child and family outcomes are a shared responsibility.

Service coordination can be a primary service, or coordination can be achieved through collaborative teaming among professionals and families. In team settings, the SLP may serve (along with other professionals and/or family members) as a service coordinator on a rotating basis or may serve as a consultant in the decision-making process. In settings where SLPs work independently and professionals from other fields are not easily accessible (e.g., private practice, some medical settings, university clinics), it is equally important that service plans be clearly articulated and followed by all who communicate regularly with the child. This coordination requires active and ongoing communication with other professionals, families, and others who interact regularly with the child (e.g., child care provider, preschool teacher, family physician, grandparent). When children are served in settings that do not provide service coordination, the SLP is

authorized to make a referral to the local EI system for formal service coordination.

Team-based services. Team-based services are one way to ensure that EI services are comprehensive and coordinated (Hebblar, Zercher, Mallik, Spiker, & Levin, 2003; IDEA, 2004; National Research Council & Institute of Medicine, 2000). Teams that include families and professionals from different fields work together to develop an IFSP. SLPs make a key contribution to the team, particularly for those children with needs in the areas of communication, language, speech, feeding/swallowing, cognition, hearing, emergent literacy, and social/emotional behavior. SLPs also play a crucial role in the assessment and provision of assistive technologies, including the use of augmentative and alternative communication systems.

Although IDEA 2004 uses the term “multidisciplinary” teams, other team models may be applied depending on the needs of the child and family. Interdisciplinary and transdisciplinary are two other commonly used team models. These three team models frequently differ in the amount of communication and coordination that exists among team members (Paul-Brown & Caperton, 2001).

Multidisciplinary teams. In a multidisciplinary approach, children are seen separately by professionals from different disciplines. Each professional completes an evaluation and/or assessment, makes recommendations, and may or may not provide services independently of other disciplines. Integration of findings and recommendations typically is left to the service coordinator or family. Team members report from their own disciplinary perspectives and often do not engage in collaborative planning or implementation. The problem with this approach is that the cohesiveness of services can be affected, resulting in fragmentation and insufficient follow through. In fact, many difficulties reported by families of children with disabilities result from poor coordination between services and across professionals (Harbin et al., 2004; McBride & Peterson, 1997; McWilliam et al., 1995).

Interdisciplinary teams. Interdisciplinary and transdisciplinary team models focus on collaboration and communication. Compared to multidisciplinary teams, interdisciplinary teams place greater emphasis on group discussions, shared responsibilities, and coordination of resources. Assessments may be conducted separately by each professional, or teams may use an “arena” method of evaluation where all or designated team members are present during the evaluation and/or assessment. Teams may use a variety of assessment tools and may consult with one another before and after the evaluation to integrate assessment plans, findings, recommendations, and treatment goals. The family, an integral member of any EI team, may interact with its child during the assessment or may observe and validate the information obtained by different professionals regarding the child’s strengths and needs. With this approach, team members share their perspectives related to goal setting and implementation of EI services.

Transdisciplinary teams. Transdisciplinary teams further reduce professional boundaries. Sometimes referred to as a primary service provider (PSP) model, a transdisciplinary approach is characterized by flexibility in the roles of team members; release of some traditional responsibilities; sharing of information and skills; and consistent interaction, communication, and coordination during planning, assessment, and intervention (D. Paul, Blosser, & Jakubowitz, 2006; Thomas, Correa, & Morsink, 2001). With this approach, one team member is the PSP who provides direct services for the child and family; other disciplines provide consultation and support.

In sum, regardless of the team model adopted, SLPs are integral members of EI teams. Sometimes they function as the PSP, particularly when the child’s main need is communication and/or feeding and swallowing. In other cases, the SLP will play a support role to professionals in other disciplines (e.g., nursing, physical therapy, occupational therapy). In all cases, however, time for meeting and communication among team members is essential for successful EI services.

The following scenario demonstrates the application of the principle related to team-based services and the value of a service coordinator in creating a cohesive team.

Creating a cohesive team. An SLP was the service coordinator for Ronald, a boy age 2;9, with cerebral palsy. Professionals on Ronald’s interdisciplinary team were providing services independently without much coordination. The SLP, occupational therapist, and physical therapist all visited Ronald at home at separate times. The team members tried to meet on a weekly basis; however, scheduling time was difficult and cancellations were common.

Clinical questions. Are all service providers focused on the same priorities? Are team members consistent in their treatment approaches? What can the SLP do to enhance communication among team members?

Clinical strategy. The SLP convened a team meeting to discuss parent priorities in the areas of communication and behavior. The purpose of the meeting was to facilitate a more cohesive approach to Ronald’s communication skill development and to develop consistent approaches to Ronald’s behavioral management. Attendees at the team conference included Ronald’s parents, maternal grandmother, preschool teacher, occupational and physical therapists, special education trainee, behavior therapist, and SLP. The team realized that team members were not consistent in their approaches with Ronald. In terms of language, their utterances were too long and complex. The team agreed on communication and behavior goals for all caregivers, teachers, and therapists that were consistent with the family’s main concerns. For example, the team agreed to use shorter and less complex utterances during interactions with Ronald (e.g., want more juice? let’s play ball, eat your cereal, sit down), to use the same phrases to inhibit his impulsive behavior (e.g., don’t touch, wait, quiet hands), and to respond to all socially

appropriate behaviors (e.g., looking, sitting, talking). The team also developed a plan for consistent use of an augmentative communication system.

The team planned time for future meetings and established a regular means of communication, including a private e-mail group that included all of Ronald's service providers. To ensure productive progress monitoring, the group logged on to the e-mail site at a designated time each week to share updates, concerns, and next steps. The SLP's main role was to provide information about communication intervention targets. She also described the cues/prompts/strategies that were most and least successful in stimulating Ronald's communication. The team discussed how the target communication skills would be incorporated into the classroom by the teacher and SLP as well as at home. The SLP sent a weekly updated notebook log of her goals and strategies and Ronald's progress to the team and updated the hard copy binder that she maintained for the family and the preschool teacher.

Principle 4. Services Are Based on the Highest Quality Evidence Available

Evidence-based practices are the touchstone of EI services and are informed by (a) current, high-quality scientific research; (b) SLP expertise and experience; and (c) family and caregiver preferences, values, and interests (ASHA, 2005; Glass, 2000; Meline & Paradiso, 2003; Schlosser & Raghavendra, 2003). Such an evidence-based approach to clinical decision making relies on external and internal sources of evidence. *External* evidence is drawn from research findings that have been published in peer-reviewed publications (e.g., Dollaghan, 2004; Fey & Justice, 2007; Finn, Bothe, & Bramlett, 2005; Gillam & Laing, 2006; Porzolt et al., 2003; Robey, 2004; Sackett, Rosenberg, Muir Gray, Haynes, & Richardson, 1996; Sackett, Strauss, Richardson, Rosenberg, & Haynes, 2000). *Internal* evidence includes policy, informed clinical opinion, professional and consumer values and perspectives, and professional consensus (ASHA, 2008b; Dollaghan, 2004). The appraisal of internal evidence may focus on a single factor or may reflect a constellation of various perspectives, including policy, informed clinical opinion, and professional consensus. Policy is based on federal, state, and agency legislation and guidelines as well as recommendations of professional organizations. Informed clinical opinion is grounded in the professionals' values and beliefs, educational backgrounds, personal and professional experiences, and translation of EI theory and research evidence to everyday clinical practices. Finally, professional consensus occurs when experts in a discipline reach general agreement about certain principles and practices through the evaluation of theory, a review of existing scientific evidence and policies, and their combined clinical experience. Like policy, statements of consensus often are published as recommended practices.

The following two scenarios demonstrate ways evidence can be used to guide clinical decision making and treatment recommendations.

Using an evidence-based approach to guide clinical decision making. Shana, a 2½-year-old girl with recurring middle ear infections, was seen at 2 years of age for an evaluation after receiving pressure equalization (PE) tubes. The results of a comprehensive and multidisciplinary evaluation placed Shana's cognitive and receptive language performance in the average range for her chronological age, but her expressive language was approximately 6 months delayed. Four weeks following insertion of the PE tubes, the parents reported that Shana's vocabulary, word combinations, and speech intelligibility increased dramatically, with noticeable advances seen each day. This observation also was made by Shana's day care provider. Shana's parents asked the SLP whether Shana would benefit from immediate speech and language services. They also wanted to know whether home-based or preschool services would be more beneficial for Shana.

Clinical questions. Are there any high-quality studies available that compare the outcomes of children with similar profiles who waited to receive services versus those who received immediate intervention? Are there any high-quality studies available comparing home and classroom service delivery models?

Clinical strategy. The SLP wanted to provide Shana's parents with scientifically supported information to respond to their two questions. She searched websites that provide summaries of evidence-based systematic reviews (e.g., ASHA's *Compendium of EBP Guidelines and Systematic Reviews* at www.asha.org/members/ebp/compendium and U.S. Department of Education's *What Works Clearinghouse* at ies.ed.gov/ncee/wwc) to determine if there were studies related to communication outcomes with early treatment versus waiting for further maturation. She also searched for studies comparing home-based versus classroom-based communication services for young children. The SLP found that in general, the potential benefits and value of early services from an SLP outweigh the possible negative consequences of a wait-and-see approach. Although the SLP could not find high-quality studies that compared home-versus classroom-based services, she located three studies that compared classroom-based and pull-out speech and language services. Although children benefited from services for both service delivery models, those receiving classroom-based services showed greater generalization for vocabulary development at home compared to when the SLP provided pull-out intervention. Based on her analysis of the existing evidence, the SLP thought that the optimal approach would be for Shana to start immediately with a combination of speech and language intervention at home and enrollment in a preschool inclusive program with classroom-based intervention. A progress monitoring plan was implemented to track Shana's gains and make ongoing modifications.

Using evidence to support and explain treatment approaches. Maria, a 2-year-old girl who was nonverbal, was diagnosed with moderate autism spectrum disorder (ASD) at 18 months of age. She displayed ritualistic behaviors such as rocking and hitting herself in the head. She was enrolled in a preschool program where the teacher and SLP worked together on objectives such as increasing Maria's communication gestures and vocalizations. Maria's parents were concerned that the focus on gestural communication would interfere with their daughter's development of speech.

Clinical questions. Is there any high-quality evidence available that shows how gestures and signs influence speech? Do gestures and signs reduce the likelihood that children will develop speech? Do gestures and signs facilitate the development of speech?

Clinical strategy. The SLP conducted an online search, checked recent journals and books, and asked other colleagues for studies related to the effect of gesture and sign training on speech. She located studies that demonstrated that gestures and signs often have a facilitative effect on the use of speech in children with severe disabilities. The SLP wrote a brief summary of the studies (e.g., research questions, how the study was conducted, quality of the study, and the outcomes). She informed Maria's parents that several studies showed that gestural communication does not have an adverse effect on the acquisition of verbal communication and that such training may even help with speech. She reviewed the written summary with the parents and offered to share and explain any of the studies. Maria's parents were more comfortable about using gestures and signs after receiving this information.

Conclusion

Applying the four guiding principles means that SLPs in EI will work collaboratively in teams to provide comprehensive, evidence-based assessment and intervention services that support family involvement, are responsive to differences in linguistic and cultural backgrounds, are individualized according to each family and child's needs, and support a child's participation in natural settings with regular communication partners. New and experienced SLPs have a responsibility to seek professional development opportunities and continue to advance their knowledge of the literature in EI. SLPs who conduct EI research can work with practicing SLPs to bridge the gap between research and practice and help SLPs provide services that are informed by high-quality research.

ACKNOWLEDGMENTS

The authors greatly appreciate the assistance of the following SLPs in providing clinical scenarios or recommending other SLPs: Roseanne Clausen, Elizabeth R. Crais, Amy Faherty, Amy

Hasselkus, Marianne Howard, Kathryn Kohnert, Lisa Rai Mabry-Price, Shauna Page, Margaret Rogers, Ellen L. Schaefer, Stacey Thompson, Sharon Willig, and M. Jeanne Wilcox.

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