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Principles of Clinical Practice for Assessment and Intervention

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The discussion in Chapter 2 states that developmental and learning disorders involve varying degrees of impairment in critical central nervous system (CNS) functions, such as motor capacities, language, cognition, sensory, and social and emotional functioning. This chapter continues the discussion by describing the functional developmental approach and its relationship to general principles of clinical practice.

THE FUNCTIONAL DEVELOPMENTAL APPROACH

Most non-progressive developmental and learning disorders, including disorders of relating and communicating (e.g., autistic spectrum or pervasive developmental disorders [PDD], multisystem developmental disorders, severe language and cognitive deficits) are nonspecific with regard to their etiology and pathophysiology. Non-progressive developmental disorders are, therefore, best characterized by types and degrees of functional limitations and processing differences as well as by symptoms that often are only one expression of a functional limitation (e.g., echolalia is a symptom; pragmatic language is the functional limitation).

Yet, as indicated in Chapters 2 and 3, both historically and recently, clinicians have focused on symptoms and groups of symptoms comprising syndromes, giving only partial attention to a broad range of important functional capacities and their related processing differences. For example, a mother was told by the senior clinician overseeing an evaluation team that because her child was "autistic," he could not interact with purpose and meaning. The clinician concluded that, because an intensive intervention would not be helpful, the therapeutic effort should be modest. Yet, this clinician did not assess the relative strengths and weaknesses of all the child's areas of functioning and underlying processing capacities to see which ones required work and which ones could be harnessed immediately for interacting and learning. For example, was this child's lack of purposeful interaction related to auditory processing and motor problems? Did he have some relative strengths in visual-spatial processing that could be partially harnessed to enable him to interact with others more purposefully? Would working with him on activities that were associated with high motivation (e.g., his eagerness to go outside) help him become more purposeful? Or, was his lack of purposeful interaction part of a biologically based CNS impairment which, by definition, would remain chronic and relatively untreatable?

Cases such as this one suggest the importance of looking at functional capacities. In fact, there is mounting evidence that:

1. Most complex, non-progressive developmental and learning disorders involve processing dysfunctions, each with its own natural history and complex, poorly understood etiology and neurobiology (see Zimmerman & Gordon, Chapter 27, and Minshew & Goldstein, Chapter, 28, this volume).

2. Key functional capacities, as well as related symptoms, learning problems, adaptive capacities, and a variety of surface behaviors, in turn, are often the result of the interaction between early and ongoing interactive experiences and these biologically based processing dysfunctions.

3. The resulting functional capacities, symptoms, or behaviors are not tied to these underlying processes in a rigid, fixed manner. For example, a child who cannot use words to symbolize a wish for juice may be able to learn to use a sign or a picture to symbolize her wish, suggesting many alternatives to symbolization.

Observed behavior, therefore, is often the result of dynamic interactions between the environment and genetic, prenatal, perinatal, and maturational variations. For example, genetic expression is influenced by a number of cellular and extracellular biological processes, including different hormones and toxic substances. Resultant physiologic levels are modified by different levels of interaction with the physical, cognitive, and social environment. Resultant functional capacities and behaviors are further influenced by interactions with different aspects of the environment. (These processes, which can be systematically described in terms of Biomedical traits, Original traits, Learned coping mechanisms, and Derived behaviors [BOLD] are more fully

discussed by Rosenbloom, Chapter 30, this volume).

Many practitioners, especially those in speech and language pathology, occupational therapy, physical therapy, education, and psychology have been expanding a dynamic functional approach that takes into account the dynamic relationship between behavior and the CNS. These practitioners are demonstrating that interactions geared to individual differences can facilitate important functional capacities such as relating, thinking, and communicating.

For example, motor-planning (including oral-motor) exercises can help develop a child's preverbal vocal, motor, and affective gesturing, imitation, and language development. Visual-spatial, problem-solving approaches can aid logical thinking and abstract academic challenges. Sensory modulation work can help a child learn to relate to others and with receptive language, whereas auditory discrimination work can facilitate the child's phonemic awareness as a basis for reading.

In spite of an expanding functional approach, however, many clinicians continue to focus predominantly on symptoms and only a few of the functional areas (e.g., more on verbal development and less on intimacy, relating, and preverbal affective gesturing). Similarly, there is a tendency to focus only on a few of the critical underlying processing differences. For example, some clinicians focus more on auditory processing and less on motor planning and sequencing, which is essential for imitation, social interaction, play, and language. Others may focus more on rote cognitive and social skills and less on spontaneous interaction to promote affective processing.) (See Tsakiris, Chapter 31, this volume).

Consequently, it is important to further systematize and expand a functional approach. In this approach, assessments and interventions must include the contributions

of all relevant areas of functioning, processing differences, and interactive relationships (see Chapter 2). Chart 1 summarizes the relevant areas.

THE FUNCTIONAL DEVELOPMENTAL APPROACH TO ASSESSMENT

Implementing an appropriate assessment of all the relevant functional areas requires a number of sessions with the child and family. These sessions must begin with discussions and observations. Structured tests, if indicated, should be administered later to further understand specific functional areas. The sessions should include:

- *Review of current functioning* with parents and other caregivers, looking at both problems and adaptive capacities.

Chart 1. Relevant Areas to Consider in a Functional Developmental Approach

The functional developmental level of the child's communicative, cognitive, and emotional capacities (i.e., how the child integrates all his capacities to meet emotionally meaningful goals, such as using a continuous flow of social problem-solving gestures to get Daddy to reach for and get him a desired toy).

Includes:
1. Shared attention and regulation
2. Engagement
3. Purposeful preverbal/gestural and affective communication
4. Complex social problem-solving interactions
5. The creative and meaningful use of ideas
6. Building logical connections between ideas or symbols (Greenspan, 1992)

Individual differences in the functioning of the child's motor, sensory, and affective patterns

Includes:
1. Sensory modulation (e.g., the degree to which the child is over- or underreactive to sensations in each sensory modality such as touch, movement, sound, sight)
2. Auditory and visual-spatial processing
3. Motor planning and sequencing and affective processing (i.e., the connection between affect, motor planning, other processing capacities, and emerging symbols)

Relationship and affective interaction patterns, including developmentally appropriate interactions (which utilize understanding of the child's functional developmental level and individual differences) or inappropriate interactions

Includes:
1. Existing caregiver, parent, family patterns
2. Educational patterns
3. Peer patterns

- *Review of prenatal, perinatal, and post-natal developmental history,* including development in all the functional areas.
- *Observations of child-caregiver interactions* for 45 or more minutes, including "coaching" or interactions with the clinician to elicit the child's highest adaptive level. There should be at least two observation sessions, with additional sessions scheduled if there is a discrepancy between parental reports and observed functioning. These sessions should serve, together with a history and review of current functioning, as a partial basis for a preliminary impression of the child's functional developmental capacities and individual processing differences, including those that are often underemphasized, such as motor planning, visual-spatial processing and affective processing, and current as well as potentially optimal child-caregiver interaction patterns.
- *Discussion of caregiver personality patterns and child-caregiver interactions,* including identification of strengths and vulnerabilities as well as family and cultural patterns.
- *Review of all current interventions, educational programs, daily activities, behaviors, and interaction patterns.* There should be review and consideration of developmentally appropriate interaction patterns and practices at home, in school, with peers, and in different interventions in regard to their capacity to foster the next level in the child's functional abilities.
- *Review and assessment to rule out (or identify) concurrent and/or contributing medical disorders.* This includes conducting appropriate biomedical assessments to identify biological interventions that may contribute to clinical management (e.g., a 24-hour EEG may reveal the potential usefulness of Depakote or other antiseizure medications). (See Robinson, Chapter 17, this volume).
- *Additional developmental and learning assessments,* such as speech and language functioning, motor and sensory functioning, and specific aspects of cognitive functioning, should be conducted as needed (as opposed to routinely) to answer specific questions. For example, a child with a circumscribed receptive language difficulty may benefit from structured language assessments to tease out more precisely the nature of the deficit. A child with a circumscribed learning problem may benefit from specific structured tasks to tease out areas of strength and weakness, such as visual-spatial processing or motor planning (e.g., a neuropsychological battery). Specific assessments, however, must always build on a basic evaluation because even circumscribed processing difficulties often make it more difficult for a child to process and understand important functions of social relationships. Therefore, the processing difficulties may be associated with emotional, behavioral, and/or family challenges.

In contrast, a child who is only fleetingly engaged or aimless and has receptive as well as expressive language problems may be best understood through ongoing interactive observation and the child's response to a comprehensive intervention program. Such a child may not be able to fully cooperate in a structured developmental assessment and even the best evaluator may only be able to describe the child's behavior in the assessment situation. In such circumstances, clinical observation of caregiver- and clinician-child interactions to observe functional capacities coupled with a review of current and past functioning provide an initial picture of strengths and challenges. Further profiling

may then best done as part of the intervention process. (See Gerber & Prizant, Chapter 5; Long & Sippel, Chapter 9; Greenspan & Wieder, Chapter 12, this volume.)

THE FUNCTIONAL PROFILE

The functional assessment leads to an individualized functional profile that captures each child's unique developmental features and serves as a basis for creating individually tailored intervention programs. The profile describes the child's functional developmental capacities, contributing biological processing differences, and environmental interactive patterns, including the different interaction patterns available to the child at home and at school, with peers, and in other settings. The profile should include all areas of functioning, not simply the ones that are more obviously associated with pathologic symptoms. For example, a preschooler's lack of ability to symbolize a broad range of emotional interests and themes in either pretend play or talk is just as important, if not more important, than that same preschooler's tendency to be perseverative or self-stimulatory. In fact, clinicians have often seen that as the child's range of symbolic expression broadens, perseverative and self-stimulatory tendencies decrease. Similarly, a child's areas of special strength may also be critical to the intervention program. For example, visual-spatial thinking capacities may enable a child with severe language problems to interact with others, learn, and reason.

Because the functional profile captures each child's individual variations, children with the same diagnosis (e.g., PDD) may have very different profiles, whereas children with different diagnoses may have similar profiles. The functional profile is updated continually through clinical observations, which serve as a basis for revising the child's intervention program.

The Affect Diathesis Hypothesis

Looking at children with autistic spectrum disorders within the context of their functional profiles highlights a number of important findings. These findings provide clues regarding a core psychological mechanism that may express the neurological differences characterizing autistic spectrum disorders. When children with autism are compared to children without autism, and level of intelligence as measured with IQ tests is controlled for, there are a number of autism-specific functional deficits. These include deficits in the ability for empathy (theory of mind) (Baron-Cohen, 1994); higher-level abstract thinking and skills in making inferences (Minshew & Goldstein, 1998); and shared attention, including social referencing and problem solving (Mundy, Sigman, & Kasari, 1990). In addition, deficits in the capacities for affective reciprocity (Baranek, 1999; Dawson & Galpert, 1990; Lewy & Dawson, 1992; Osterling & Dawson, 1994; Tanguay, 1999; Tanguay, Robertson, & Derrick, 1998), and functional (pragmatic) language (Wetherby & Prizant, 1993) also appear specific to autism.

These functional deficits have a feature in common that may suggest an overriding or core psychological deficit. Clinical work with infants and children without challenges and those with biological challenges and environmental challenges demonstrates that the capacities for empathy, psychological mindedness, abstract thinking, social problem solving, functional language, and reciprocity all stem from the infant's ability to connect affect or intent to motor-planning capacities and emerging symbols (Greenspan, 1979, 1989, 1997). Relative deficits in this core capacity lead to problems in these higher-level emotional and intellectual processes.

A child's capacity to connect affect to motor planning and emerging symbols

becomes relatively apparent between 9 and 18 months of age as the infant shifts from simple patterns of engagement and reciprocity to complex chains of affective reciprocity that involve problem-solving interactions. Consider a 14-month-old child who takes his father by the hand and pulls him to the toy area, points to the shelf, and motions for a toy. After Dad picks him up, he nods, smiles, and bubbles with pleasure. For this complex, problem-solving social interaction to occur, the infant needs to have a wish, desire, or intent (i.e., inner affects or emotions) that indicate what he wants. The infant then needs an action plan (i.e., a plan to get his toy) that may involve many steps. However, the direction-giving affects must connect to the action plan in order for the child to create a pattern of meaningful, social problem-solving interactions. Without this connection between affect and action plans (i.e., motor planning), complex interactive problem-solving patterns are not possible. Action plans without affective direction or meaning will tend to become repetitive (perseverative), aimless, or self-stimulatory, which is what is observed when there is a deficit in this core capacity.

As the ability to form symbols emerges, inner affects (intent) need to connect to symbols to create meaningful ideas, such as those involved in functional language, imagination, and creative and logical thought. The meaningful use of symbols usually emerges from meaningful (affect-mediated) problem-solving interactions that enable a toddler to understand the patterns in her world and eventually use symbols to convey these patterns in thought and dialogue. Without affective connections, symbols such as action plans will be used in a repetitive (perseverative) manner (e.g., scripting, echolalia).

Affectively guided problem-solving interactions and symbols are necessary for all the unique capacities that distinguish individuals

with autism from individuals without autism, as outlined earlier. For example, long chains of social reciprocity depend on affect guiding interactive social behavior. Shared attention, which includes social referencing and shared problem solving, also depends on affect guiding interactive social behavior. Empathy and theory of mind capacities depend on the ability to understand both one's own affects or feelings and another person's affects or feelings, and to project oneself into the other person's mindset. This complex emotional and cognitive task begins with the ability to exchange affect signals with another person and, through these exchanges, emotionally sense one's own intent and sense of self in interaction with another. Similarly, higher-level abstract thinking skills, such as making inferences, depend on the ability to generate new ideas from one's own affective experiences with the world and then reflect on and categorize them (Greenspan, 1997).

In observations of infants and toddlers heading into autistic patterns and in taking careful histories of older children with autism, we have noted that children with autistic spectrum patterns did not fully make the transition from simple patterns of engagement and interaction into complex affect-mediated, social problem-solving interactions. They, by and large, did not progress to a continuous flow of affective problem-solving interchanges. Even affectionate children who were repeating a few words or memorizing numbers and letters, and who went on to evidence autistic patterns, did not master, for the most part, this early capacity to engage in a continuous flow of affect-mediated, gestural interactions. These children were then unable to develop higher-level capacities for empathy and creative and abstract thinking unless an intervention was initiated that focused on facilitating affect-mediated interactions.

In a review of the functional profiles of 200 cases of children with autistic spectrum

disorders, we observed that most of the children shared this unique processing deficit. At the same time, the children differed with regard to other processing deficits involving their auditory, motor-planning, visual-spatial, and sensory modulation abilities. Approximately two-thirds of the children who developed autistic spectrum disorders had this unique type of biologically based processing deficit that involved the connection of affect or intent to motor planning and sequencing capacities as well as to emerging symbolic capacities (Greenspan and Wieder, 1997).

The hypothesis that explores this connection between affect and different processing capacities is called the *affect diathesis hypothesis.* In this hypothesis, as indicated previously, a child uses his affect to provide intent (i.e., direction) for his actions and meaning for his words. Typically, during the second year of life, a child begins to use his affect to guide intentional problem-solving behavior and, later on, meaningful use of language. Through many affective problem-solving interactions, the child develops complex social skills and higher-level emotional and intellectual capacities.

Because this unique processing deficit occurs early in life, it can undermine the toddler's capacity to engage in expectable learning interactions essential for many critical emotional and cognitive skills. For example, she may have more difficulty eliciting ordinary expectable interactions from her parents and the people in her immediate environment. Without appropriate interaction, she may not be able to comprehend the rules of complex social interactions or to develop a sense of self. A child normally develops these skills and capacities at an especially rapid rate between 12 and 24 months of age. By the time a child with processing difficulties receives professional attention, her challenging interaction patterns with her caregivers

may be intensifying her difficulties. She is likely to perplex, confuse, frustrate, and undermine purposeful, interactive communication with even very competent parents. This loss of engagement and intentional, interactive relatedness to key caregivers may cause a child to withdraw more idiosyncratically into her own world and become even more aimless and/or repetitive. What later looks like a primary biological deficit may, therefore, be part of a dynamic process through which the child's lack of interactions has intensified specific, early, biologically based processing problems and derailed critical social skills.

Biologically based processing (regulatory) difficulties, therefore, often contribute to, but are not decisive, in determining relationship and communication difficulties. When problems are perceived early, appropriate professional help can, to varying degrees, teach children and caregivers how to work with the processing (regulatory) dysfunctions, including helping the toddler connect affect to emerging action plans and their associated relationship and communication patterns. Such children can often become capable of forming warm relationships and climb the developmental ladder leading to language and thinking capacities.

There are many children who do not evidence autism but have developmental problems in which intentionality or purposeful action is difficult in its own right and results in less practice or use (e.g., severe motor problems). These children may either have difficulty forming or may secondarily lose their ability to connect intent or affect to motor planning. In these circumstances, creating purposeful interactions around any motor skill (e.g., head or tongue movements) may strengthen the affect-motor connection, reduce aimless, repetitive behavior, and facilitate problem solving and thinking. Recent

MRI studies suggest that practicing and improving motor skills may enhance the developmental plasticity of neuronal connections (Zimmerman & Gordon, Chapter 27, this volume).

In our review of 200 cases, we also found that, although many children with autistic spectrum disorders shared a primary deficit (i.e., connecting affect to processing capacities), they differed in the levels of developmental functioning of their different processing capacities or "component parts." We noted that the relative strength of each component part tended to determine symptoms and splinter skills, such as whether a child lined up toys (which requires some motor planning) or just banged them, or scripted TV shows (which requires some auditory memory) or was silent. It was also found that children with relatively stronger component parts tended to make rapid progress once they were helped to connect affect or intent to their other processing capacities. Children with weaker component parts tended to make more gradual progress and required more intensive, specific therapies, such as speech and occupational therapy, in order to work with the component part directly.

These observations are consistent with recent neuroscience studies suggesting that different processing capacities may compete for cortical access, depending on functional use (Zimmerman & Gordon, Chapter 27, this volume). They are also consistent with neuropsychological studies of individuals with autism but without mental retardation that show that "within affected domains, impairments consistently involved the most complex tasks dependent on higher-order abilities (i.e., concept formation, complex memory, complex language, and complex motor abilities) (Minshew & Goldstein, 1998). Higher-level capacities tend to depend more on "meanings" which, in turn, depend on affective interactions with the world. Furthermore, these observations are also consistent with work on the shifts to a more complex central nervous system organization, including hemispheric connections that occur at the end of the first year of life and early part of the second year, just as the ability to engage in affect-mediated chains of social problem solving are on the ascendancy (Benson & Zaidel, 1985; Courchesne et al., 1994; Dawson, Warrenburg, & Fuller, 1982; Sperry, 1985).

Dynamic Assessments over Time and in the Context of Interventions

The assessment of the functional processing and developmental capacities just described cannot be implemented based only on structured tests or a short observation. A child's "functioning" involves her ability to learn over time and in contexts that provide learning opportunities. For example, observing how a child responds to interventions that foster engagement and interaction reveals more about the child's relationship capacity than a one-time evaluation of how she relates to the clinician in an office. Similarly, the child's ability to learn to gesture, imitate words, and use words purposefully is best assessed by observing her at home, in school, and in the clinician's office when the child is highly motivated and provided with developmentally meaningful, interactive opportunities.

Traditional ways of assessing children with developmental problems, which include time-limited observations and structured tests, may often present a misleading picture because they do not deal with the child's variability and range of functioning by looking at the child's functioning in a dynamic learning situation over time. In fact, the use of structured tests raises an interesting paradox. Because many children with special needs are quite variable in their functioning, fixed (i.e., standard) presentations of stimuli,

which may appear attractive from a research point of view, are likely to produce a great deal of variability in functioning or bring out the child's lowest level of possible functioning. In contrast, optimal levels and stability of performance are enhanced by the flexibility of the presentation.

Criteria for Immediate Evaluation vs. "Wait and See"

A child with functional developmental impairments involving foundation-building capacities, such as relating and using gestures to communicate and problem solve, often requires *immediate* attention, not a "wait-and-see" attitude. Because functional capacities build on each other and there is mounting evidence of age and time limits to developmental, neurobiological plasticity in a child's brain, delaying evaluation can increase functional impairments. Delaying intervention until a child is 3 or 4 years old and evidences a clear syndrome tends to increase the therapeutic challenge and may affect the ultimate prognosis. As the child falls further and further behind, there are more missed opportunities. Therefore, a determination of developmentally significant functional impairment in and of itself should serve as a criterion for initiating an appropriate evaluation and intervention. This is especially true for functional impairments that derail the child's ability to attend, relate, communicate, play, or think. Because the functional impairments are the focus of the intervention, it is possible to begin the therapeutic work even while observing the child over time to determine an appropriate diagnosis. As new observations are made, the intervention program can be revised. In assessing functional impairments, distinctions must be made between circumscribed problems that do not derail the basics of relating, communicating,

and thinking and more substantial challenges that do derail them. For example, a toddler with a mild articulation problem who relates and communicates with purposeful gestures (e.g., takes Dad to the toy chest) has a circumscribed difficulty. This child is significantly different from a toddler who cannot use social gestures to show what he wants, even if he can repeat words and is being derailed in his fundamental ability to relate and communicate.

RETHINKING AUTISM, MENTAL RETARDATION, AND SEVERE ATTENTIONAL AND LEARNING PROBLEMS

Moving from standardized, one-time assessments to observing functional impairments in the context of truly helpful interventions over time will certainly change how therapists diagnose problems. It may, at times, change the ultimate diagnosis chosen for a child. These ongoing observations are especially relevant for autistic spectrum disorders, mental retardation, and many types of attentional and learning problems.

Autistic Spectrum Disorders

Some children who meet DSM-IV criteria for autistic spectrum disorders have responded very quickly to developmentally based, comprehensive intervention programs and become warmly related, interactive, and verbally communicative (Greenspan, 1992; Greenspan & Wieder, 1997, 1998). Within 1 year, for example, many of these children became engaged and interactive, overcoming their perseverative and self-stimulatory patterns. After 2 years of intervention, many used language flexibly and creatively, though still with delays. If the diagnosis of these children had been delayed for a year while

their response to intervention was observed, the diagnosis for this group of rapidly improving children would be language disorders and motor-planning problems, rather than the autistic spectrum disorders with which they initially presented. If diagnosis were delayed for 2 years, the diagnosis would be a less severe language disorder. Many of these children subsequently developed excellent language and learning abilities as well as a solid capacity to relate to others, including peers, with warmth, empathy, creativity, and a sense of humor. They often evidenced in their later school years more circumscribed processing problems involving motor planning and sequencing.

Other children who initially met the criteria for autistic spectrum diagnoses have made much slower progress: 1 and 2 years into the intervention, they continued to meet the criteria for autistic spectrum disorders, although with a greater capacity to relate and communicate. Still others have made extremely slow progress or no progress at all, continuing to meet the criteria for autism after many years.

Although each of these groups had a different presenting profile in terms of developmental capacities (e.g., relatedness, motor planning and sequencing, and visual-spatial processing), the most distinct difference among the groups is the way in which they have responded to an optimal intervention program. The response to intervention can further classify problems in relating and communicating. It raises a question of whether or not children who make extremely rapid progress and no longer meet DSM-IV criteria for PDD should be diagnosed as having an autistic spectrum disorder or a separate type of neurodevelopmental dysfunction. Should these children be diagnosed based on their initial presenting patterns or should therapists take into account their response to an intervention program, thereby leading to alternative diagnostic considerations? Further complicating the

diagnostic challenge is that many symptoms used by clinicians to diagnose autistic spectrum disorders, such as hand-flapping, repetitive behavior, and self-stimulation, are not specific to autism. These behaviors are also seen in children with severe motor-planning problems and sensory-modulation difficulties. Lack of relatedness and affective reciprocity is a more specific symptom, but it is often the first behavior to improve, especially in the children who respond quickly to treatment.

Mental Retardation

Because mental retardation implies relatively permanent cognitive deficits, observing the response to intervention may be even more important then with autistic spectrum disorders. Often, children who have a number of cognitive deficits are assessed as having relatively permanent global deficits and are diagnosed with varying degrees of mental retardation. Historically, intelligence tests (e.g., two standard deviations below the norm constitutes mild retardation) have been used to make this determination. This method, however, tends to look at the child only at one point in time and not take into account her learning curve over a longer period of time, which is essential for observing changes in her many functional capacities. Contrary to traditional expectations, many children who are diagnosed with mental retardation evidence different patterns of growth and, on close scrutiny, evidence relative strengths and weaknesses even if their intelligence subtest scores are all low.

The most accurate method for making a proper diagnosis is, therefore, to observe a child's progress while fostering her growth with a truly optimal program. If the child's learning curve levels off in spite of the best efforts of a comprehensive, intensive, intervention approach, it then might be reasonable

to conclude that the child has stopped making progress. Therefore, although cognitive problems should be noted and described, a diagnosis of mental retardation should only be given if the child is in an optimal program with family involvement, and her learning curve has leveled off in all functional areas for 2 to 3 years.

Severe Attentional and Learning Problems

There are two challenges in working with children with severe attentional and learning problems. The first challenge is working with them in relation to their underlying processing patterns rather than working only on their symptoms or behaviors. For example, a motor-planning and sequencing problem will make it difficult for a child to plan and organize actions, such as doing homework or lining up the numbers to do math problems. An auditory processing problem may make learning to read difficult because of poor sound discrimination (i.e., poor phonemic awareness). Underreactivity to sensations such as touch, pain, and sound may lead to sensory craving, increased activity, and poor attention.

The other challenge for clinicians is to look at all areas of functioning. There is a tendency to focus only on the circumscribed learning, attentional, or processing problems and ignore how, for example, they may influence areas of social and emotional functioning. For example, the same visual-spatial and motor-planning problems that may make planning and organizing school work and math difficult may also make it difficult for a child to interpret other people's facial expressions and body posture, which leads to social and emotional misperceptions. This type of emotional problem is not a reaction to frustration or feelings of failure but a direct consequence of the same processing problems that make school-

work difficult. Therefore, circumscribed attentional and learning problems, even if seemingly localized to school, require a comprehensive functional developmental evaluation.

A child's cognitive challenges and changing abilities should be continually assessed. Access to services should not be delayed pending a definitive diagnosis but provided to a child based on the individual profile of functional developmental impairments. If necessary for administrative purposes, a provisional diagnosis can be used.

A COMPREHENSIVE, DEVELOPMENTALLY BASED APPROACH TO INTERVENTION

A functional approach to assessment leads to a comprehensive approach to intervention that deals with all the relevant functional areas in an integrated manner. An essential part of intervention is a review of the child's functional developmental profile based on assessments of the child's functional developmental level and capacities, individual processing differences, and the different interaction patterns available at home and school, with peers, and in other settings. The functional assessment is updated in an ongoing manner with continuing clinical observations as part of the intervention. These ongoing observations are the basis for revising the child's intervention program.

A comprehensive intervention program involves working with the emotional interactions between the child and family to support each of the child's critical developmental capacities and related underlying processing differences. This Developmental, Individual Differences, Relationship-based (DIR) approach can be conceptualized as a pyramid. Each of the components of the pyramid build on each other and are described briefly in the following sections and by Figure 1.

Protective, Stable, Secure Relationships

At the foundation of the intervention pyramid are the protective, stable, developmentally supportive relationships and family patterns that all children require, especially those with developmental challenges. This foundation includes physical protection and safety and an ongoing sense of security. Some families require a great deal of support, therapy, or both in order to stabilize and organize these basic family functions. For example, some families may be dealing with extreme poverty and chronic states of fearfulness, abuse, and neglect. Some families require counseling to explore family patterns and relationships, particularly in connection to the challenges of coping with a child with special needs and the effects on relationships between spouses and siblings.
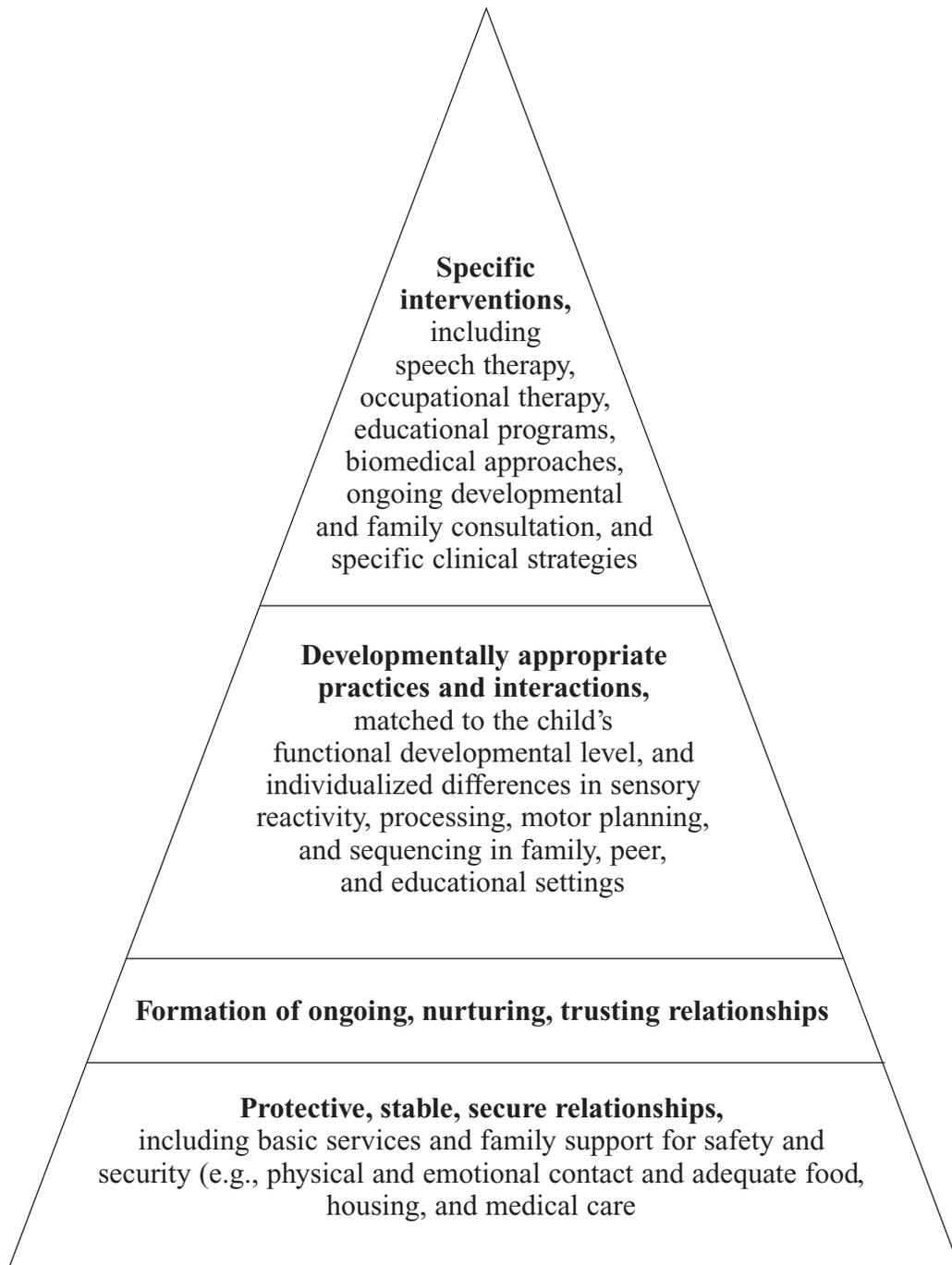
Intervention programs require staff trained to assess family needs, develop alliances, problem solve, and advocate, including advocating for social and economic support. They also need to provide family counseling and family or personal therapy where indicated (Barber, Turnbull, Behr, & Kerns, 1988; Bronfenbrenner, 1986; Dunst & Trivette, 1988; Powell, Hecimovic, & Christensen, 1992; Robbins, Dunlop, & Plienis, 1991; Turnbull et al., 1986; and Shanok, Chapter 14, this volume).

Ongoing, Nurturing, Trusting Relationships

At the second level of the pyramid are the ongoing and consistent relationships that every child requires. Typically developing children require nurturing relationships to help them achieve emotional and cognitive competency. Children with special needs, who often already have compromises in their capacities to relate, are in even greater need of warm, consistent caregiving. Their caregivers, however, often face challenges in sustaining intimate relationships because it is so easy to misperceive their children's intentions. Understanding their children's behavior as attempts to cope with their difficulties or as being overwhelmed by their difficulties can often help caregivers recognize these misperceptions and develop more creative and empathetic ways of relating to their children. For example, children who are hypersensitive to touch may not be rejecting their parents' comfort and care. For such a child, parents may have to avoid light touch and use deep pressure to help the child feel more comfortable. Or, parents may need to understand that the child who jumps on a toddler who is crying may not be primarily aggressive but is so sensitive to the sounds of the cry that he panics and wants the noise stopped. Similarly, the child who has difficulty comprehending words may become confused and avoid communication. He may benefit from pictures or gestural signs to understand his environment and predict what will happen next in his interactions with caregivers. The child who is generally avoidant or self-absorbed may be underreactive to sensations, have low muscle tone, and need greater "wooing" to get beyond his self-absorption.

The importance of interactive relationships cannot be underestimated. Almost all learning occurs in relationships, whether in the classroom, with the family, or in therapeutic sessions. No one would deny that the ability to enjoy and participate in relationships is pivotal for learning to relate to others, experience intimacy and positive self-esteem, and develop healthy coping strategies. In addition, most cognitive or intellectual capacities learned in the first 4 or 5 years of life are also based on emotions and relationships (Greenspan, 1997a). For example, infants

**Specific
interventions,**
including
speech therapy,
occupational therapy,
educational programs,
biomedical approaches,
ongoing developmental
and family consultation, and
specific clinical strategies

**Developmentally appropriate
practices and interactions,**
matched to the child's
functional developmental level, and
individualized differences in sensory
reactivity, processing, motor planning,
and sequencing in family, peer,
and educational settings

Formation of ongoing, nurturing, trusting relationships

Protective, stable, secure relationships,
including basic services and family support for safety and
security (e.g., physical and emotional contact and adequate food,
housing, and medical care

Figure 1. The Intervention Pyramid for Children with Special Needs

first learn initial concepts of causality in early relationships, as a smile lead to a smile back, crying leads to comfort, or reaching out leads to being picked up, rather than in activities such as banging objects on the floor, which leads to learning that this action makes a sound. Similarly, the meaning of words and gestures, the sense of time, and concepts of quantity are also learned as part of interactive, affective relationships early in life (Greenspan, 1997a). For example, for a toddler, "a lot" is more than she expects; "a little" is less than she wants. Words are connected to the emotional experiences that define them, and gestures become organized into patterns associated with emotions and expectation. For example, Dad's smile leads to a hug and tickle.

Relationships serve a number of functions for young children. Most important, they must foster warmth, intimacy, and pleasure. In addition, relationships provide the context in which children experience security, physical safety, protection from illness and injury, and fulfillment of their basic needs. The regulatory aspects of relationships (for example, protection of the child from over- or understimulation) help the child maintain pleasure in intimacy and a secure, alert, attentive state that permits new learning and development to occur.

Relationships provide the basis for communication. Initially, the infant's communication system is nonverbal. It involves affect cueing (smiles, assertive glances, frowns), contingent behavioral interactions (pointing, taking and giving back, negotiating), and the like. From the earliest reciprocal smiles to a child taking her mother's hand, walking to the refrigerator, and pointing to a favorite food, there emerges a complex system of affective, gestural, and behavioral interactions that continues throughout the life of the individual. Even though this nonverbal system eventually works in conjunction with symbolic-verbal

modes of communication, it remains more fundamental: for example, adults tend to trust a person's nonverbal nod or look of approval more than words of praise. The system of reciprocal affective gesturing enables the child to negotiate with his caregivers (environment) in small, graduated increments. Therefore, self-regulation improves and becomes context-dependent, and learning can become subtle and highly differentiated.

Relationships are, therefore, the context for learning which behaviors are appropriate and which are inappropriate (Greenspan, 1974, 1975). As children's behavioral repertoires become more complex in the second year of life, discriminative and reinforcing properties of relationships define which behaviors increase and which behaviors decrease. Repertoires are built up through the give-and-take between children and caregivers (i.e., discriminative learning). In addition to behaviors, relationships help organize a child's wishes, emerging self-perceptions, and a sense of self. The emotional tone and subtle affective interactions of relationships are, therefore, just as important as more easily observable behaviors.

Relationships enable a child to learn to symbolize experience. The first objects with which the child has a highly emotional experience are not playthings, but rather the human "objects" with which he interacts. In his interactions, the child goes from "acting out" his desires or wishes to picturing them in his mind and labeling them with a word. He goes from desiring Mom and grabbing her to saying "Mom" and looking at her lovingly. This transformation heralds symbolic awareness.

The ability to picture an object when it is displaced in both time and space is a much-used marker for the child's achievement of *object permanence* and the emergence of symbolic capacities. Pretend or imaginative

play involving emotional human dramas (e.g., the dolls are hugging or fighting) helps the child learn the types of affective-based symbolization that will enable her to connect an image to a wish or intent and then use this image to think, "If I'm nice to Mom, she will let me stay up late." Figuring out the motives of a character in a story as well as the difference between ten cookies and three cookies will depend on the child's capacity for affective symbolization (Greenspan, 1997a).

The child's ability to create mental pictures of relationship and, later, other objects, forms the basis for more advanced symbolic thinking (Greenspan, 1997a & b). For example, a key element essential for future learning and coping is the child's ability for self-observation, problem solving, and creative thought. The ability to self-observe is essential for self-monitoring of activities as simple as coloring inside or outside the lines, or matching pictures with words or numbers. Self-observation also helps a child label rather than act out feelings. It helps her to empathize with others and match behavior to the expectations of the environment.

Self-observation is essential for advanced learning and social negotiation. The ability for self-observation emerges from the ability to observe oneself and another in a relationship and is a product of the same emotional interactive relationships as earlier abilities. Similarly, advanced cognitive skills involving numbers, reading, and analytic thinking build on fundamental, relationship-based capacities. As relationships embrace symbolic capacities, language grows from words to sentences and concepts derived from daily affective experiences. Similarly, cognitive capacities involving time and space emerge out of the day-to-day negotiation of waiting or not waiting, or of having a little more or less of this or that. Even reading comprehension abilities blossom from the natural give-and-take of

dialogue with parents. The child can only understand the meaning of the words or pictures in a book in the context of her daily emotional experiences with others. Without emotional experience to abstract from, there would be no symbolic meaning.

The starting point for mobilizing growth involves meeting a child at his current functional developmental level and forming a relationship and engaging in emotional interactions at that level. Children will vary; some are unrelated and unpurposeful and require work on engaging and intentional communication whereas others are purposeful but require extra help in using symbols. Still others use symbols or ideas in a fragmented way and need to learn how to be logical and more abstract. For each developmental level, special types of interactions can enable a child to master that level and its related capacities.

To support the child's ability to relate requires a significant amount of time, consistency, and understanding. Family difficulties or frequent turnovers among childcare staff or teachers may compromise the requirement for consistency in a child who is beginning to learn how to relate to others.

Developmentally Appropriate Practices and Interactions

At the third level of the pyramid lie consistent relationships and interactions that have been adapted to the individual differences and functional developmental needs of each child, which can be thought of as *developmentally appropriate practices and interactions* for the child with special needs.

Developmentally appropriate practices must characterize family and all other interactions, including home and educational programs. They should also be integrated into the different therapies. Developmentally appropriate interactions and practices, how-

ever, are not always easy for caregivers, educators, and therapists to implement. The child's tendency for self-absorption, perseveration, self-stimulation, impulsive actions, or avoidance often elicits counterreactions that attempt to alter the child's immediate behavior rather than to build interactions that will both promote growth and alter the immediate behavior.

Children who do not have special needs often involve themselves in what the National Association for the Education of Young Children (NAEYC) has described as developmentally appropriate practices: that is, they play on their own (part of the time) or with peers, siblings, or parents interactively and using developmentally appropriate toys, games, and puzzles in a constructive, growth-facilitating manner. For children with special needs who, because of their processing difficulties, may find it very hard to interact with people or toys in a way that facilitates their development, the challenge is to help them become involved in their own special types of developmentally appropriate practices and interactions. Doing this involves using the profile of the child's functional developmental level, individual differences in sensory processing, sensory modulation, motor planning and sequencing, and caregiver and family interaction patterns to construct interactions that will be pleasurable as well as developmentally meaningful and facilitating. For example, a 4-year-old may only have the intermittent functional capacities of a 2-year-old, understand visual-spatial experiences better than auditory ones, and be oversensitive to sensations. The focus, therefore, should involve working on engaging, gesturing, and beginning to elaborate symbols by using a lot of visual support and pretend play in a very soothing and regulating context. (See Greenspan & Wieder, Chapter 12, this volume.)

Home-Based Component

Children spend many hours at home. When a child has severe processing difficulties, his choice of activities may *not* be developmentally appropriate or facilitating, such as hours of television-watching, perseverative behavior, or repetitive computer games. Children generally are happier, more productive, less stressed, and make more progress when involved in *developmentally appropriate interactions and practices*. In fact, these types of interactions in the home can become the most important factor for aiding a child's growth.

Developmentally appropriate practices often require one-on-one work with the child. Parents must decide how much they can do on their own and how much help to elicit from volunteers, hired students, or home visitors from community, state, or county-supported intervention programs (e.g., wrap-around services in the state of Pennsylvania provide a very useful model in which bachelor's and master's level professionals often spend more than 20 hours a week supporting the program at home).

The home-based component of developmentally appropriate interactions and practices can be divided into two parts. One involves developmentally appropriate interactions based on following the child's natural interests and emotional inclinations. The other focuses on semistructured problem-solving interactions that also harness the child's "affect" but involve semistructured created situations to facilitate mastery of specific processing capacities, and emotional, cognitive, language, and motor skills. These two components of the home-based program are described in the following sections.

Following The Child's Lead

The caregiver should follow the child's emotional interests to engage him at his functional developmental level and challenge him

to move to the next level, thereby gradually moving the child toward negotiating the six levels outlined in Chart 1. These spontaneous interactions in which the caregiver follows the child's lead will often take on two qualities. First, the caregiver helps the child move in the direction that interests him by, for example, putting the ball the child is interested in on her head. The child may then take the ball off the caregiver's head, thus being drawn into focusing on the caregiver and engaging in pleasurable relating and purposeful, two-way communication. Second, the caregiver can become playfully obstructive. For example, if the child perseveratively opens and closes doors, the caregiver could get "stuck" behind the door. This action leads the child to focus on the caregiver as he tries to push her away from the door, giggling as he succeeds—only to have the caregiver run back to the door again to resume the game. In this way, the caregiver facilitates focus and engagement. As the child purposefully tries to engineer moving the caregiver away from the door, intentional, two-way communication is facilitated. Eventually, complex problem-solving behaviors and even the use of words, such as "go" or "away" can be elaborated off of the child's spontaneous, emotional interest in the door. (Strategies for the spontaneous use of developmentally appropriate interactions to help the child master each of the six core functional emotional capacities are described in detail in Greenspan & Wieder, Chapter 12, "Developmentally Appropriate Practices and Interactions.")

Semistructured, Problem-Solving Interactions

The caregiver should create learning challenges for the child to master. These may involve social, motor, sensory, spatial reasoning, language, and other cognitive skills. For example, if the goal is to help a child learn a new word, such as "open," the caregiver might put the child's favorite toy outside the door so that she would want to open it. The caregiver may then help the child imitate the word "open." The child, in this way, is practicing gesturing and using words together. Imitating the sounds "ope" for "open" while opening the door also provides the child with immediate meaning. Tying the word to affect or intent (and meaning) facilitates generalization. This approach is in contrast, for example, to the child saying the word "open" in response to a picture card and only later trying to use the word in real life to solve a problem.

In addition to working on language and cognitive and social capacities, semistructured problem-solving interactions should focus on activities that enable the child to engage in (1) sensory modulation and motor-planning exercises, such as jumping on a trampoline or mattress, running, spinning, appropriate roughhousing with deep tactile pressure, and obstacle courses; (2) perceptual-motor exercises and looking and doing games, such as throwing and catching a big Nerf ball, kicking, and reaching for moving objects; and (3) visual-spatial exercises, such as treasure hunt games, hide-and-seek, and building complex structures from visual cues.

In general, it is most effective for the child's therapeutic team, including parents, educators, speech pathologists, and occupational therapists to meet weekly to design the functional goals for the semistructured aspect of the home-based intervention. At least one-third to one-half of the child's available time at home should be spent on spontaneous interactions (following the child's lead and working off of natural affect and inclination to foster the six functional levels described earlier) and the remaining two-thirds to one-half on developmentally appropriate, semistructured problem-solving activities.

Semistructured, problem-solving activities also need to be geared to each child's unique profile. When put into a problem-solving context with emotional intent, the following types of activities may also be included:

- *Imitating new words and using concepts* that help the child solve a problem he wants to solve, for example, "open," "up there," or "go."
- *Motor-based challenges,* such as gross-motor movement, balance, movement in space, running, jumping, spinning, perceptual-motor activities (involving looking and doing and crossing the midline).
- *Spatial problem solving,* such as treasure hunt games in which the child is given clues about how to find her favorite toy, first in the box in front of her and, eventually, in the box upstairs near another box behind the blue chair.
- *Motor-imitation exercises,* such as copying the caregiver by touching eyes, ears, nose and, eventually, vocal (sound) imitations leading to word development.
- *Spatial and quantity concepts,* such as "here," there," "big," "little," and, eventually, including "more" or "less," and association of numbers, time, or distance (e.g., finding Mommy in different parts of the house, negotiating one versus three cookies, or showing with hands the difference between a little and a lot).
- *Facilitation of conceptual understanding* by using cards where the word is under the picture and is used to help the child get the juice or a favorite toy, or as a cue for pretending what the word or sentence conveys.
- *Visualization exercises,* as the child becomes older, to help the child picture words, sentences, or quantities ($2 + 2 = 4$) to facilitate a deeper understanding of concepts. These concepts may also be acted out.

Specific therapies often work in a semistructured manner on these types of important capacities. (See the Table of Contents for related chapters.) Team meetings should suggest the goals of this part of the home program.

Peer Interaction

Peer play is especially important once the child has mastered preverbal problem-solving skills and is moving into the early stages of using ideas in a functional and spontaneous manner. The now-engaged, intentional, partially verbal, and imaginative child needs to practice his emerging skills not only with adults but also with other children who are at a similar or higher developmental age (i.e., the other children need to be interactive, somewhat verbal, and imaginative). However, the playmates need not be the same age as the child. For example, if the child is $4^{1}/_{2}$ years old, but has a functional, emotional developmental capacity of 3 years, he might prefer the company (and vice versa) of 3-year-old playmates.

At this point, individual, one-on-one play dates should occur four or more times per week for one hour or more. Initially, an adult may have to facilitate the interactions to help deter the children from drifting into parallel play. The adult may create a game to help the children work jointly, such as having both children hide together while the adult tries to find them. While following the children's lead, the caregiver is also free to create games that facilitate interactions among the children. The goal is to help the children "rub shoulders" with each other and to communicate with gestures and words.

The need for peer play occurs at about the same time that a child needs to be integrated, often with an aide, into a regular preschool program or into an ongoing inclusion or integrated program.

Setting Limits, Facilitating "Compliance"

Developmentally appropriate practices used to foster new functional capacities can help parents, clinicians, and educators with one of their most difficult challenges—how to integrate the process of setting limits and compliance with other clinical and educational goals. Following rules and maintaining safety are understandable goals. Not infrequently, however, the need for compliance and control takes the form of strapping a child into a chair, physically forcing him to walk to the bathroom, or using other types of restraint.

The key to teaching a child to follow rules is to provide developmentally appropriate practices and interactions that meet the child at his functional developmental level in the context of his individual differences. For example, for a child who is impulsive and is not yet capable of logical, verbal thinking and conversation, developmentally appropriate interactions mean a one-on-one aide working with the child on the basics of relating and purposeful interaction. The back-and-forth signaling, which will include limits, however, will be of the type one would implement with a 1- to 2-year-old child. Through this type of one-on-one interaction, the child gradually learns how to be a purposeful, preverbal communicator. Gradually, responding to limits becomes a part of this purposeful communication. Expecting a child who can not yet negotiate basic needs with a series of back-and-forth signals to follow group-oriented rules will often result in frustration, anger, impulsive behavior, and, more importantly, slower progress. Developmentally appropriate practices are more likely to tap into potential plasticity from within the individual child's own brain than will externally-imposed structured techniques (i.e., too complex or restrictive) that bypass neural networks already in place.

As a child makes progress and is purposefully interactive, both encouragement and sensitive limits can help him work with groups of children and follow expectations. Dangerous, as opposed to noncompliant, behavior needs to be dealt with immediately with firm but gentle limits. These limits should be based on the child's functional developmental capacities, not on actual age or expectations for the other children in a group. Just as Congress has appropriately mandated that a child be educated in the least restrictive environment, therapists should teach the child the *least restrictive, developmentally appropriate* tactics to control his behavior and be sensitive to the needs of others.

Specific Therapies and Educational Strategies

At the apex of the pyramid are the specific therapeutic and educational techniques that build on and also facilitate the child's basic capacities for attention, engagement, intentional two-way communication, and the creative use of symbols. In this way, new capacities are tied to the child's sense of purpose and self (i.e., his affects). Integrating therapeutic strategies into the child's naturally occurring interests and activities can be very helpful in simultaneously fostering her capacities to initiate, engage, communicate, problem solve, and think, as well as learn new functional skills. While new skills are on the ascendancy, perhaps in relation to maturational shifts, is an optimal time to intensify a particular therapy that supports that skill, such as physical therapy to facilitate walking.

A variety of strategies have been advocated. Some attempt to offer a comprehensive approach whereas others focus on specific issues. However, an approach cannot be truly comprehensive unless it works with all the levels of the pyramid. Both focused and partially

comprehensive approaches must build on the foundation previously described. These include educational approaches (e.g., Bailey & Wolery, 1992), cognitive, language, sensory, and motor processing approaches (e.g., Prizant & Wetherby, 1988; Bricker, 1993), peer models (Odom & Strain, 1986; Strain, Shores, & Timm, 1977), behavioral approaches (Lovaas, 1980, 1987; Durand, Berotti, & Wiener, 1993; Haring & Lovinger, 1989; Odom & Haring, 1993), work with family patterns (e.g., Barber et al., 1988; Bronfenbrenner, 1986; Dunst & Trivette, 1988; Powell et al., 1992; Robbins et al., 1991; Turnbull et al., 1986), interactive "floor time" approaches (Greenspan, 1992; Greenspan & Wieder, 1998), and work with the social milieu (e.g., Ostrosky, Kaiser, & Odom, 1993; Wolfberg & Schuler, 1993).

Speech and Language Therapy

Speech-and-language therapy is especially helpful for preverbal, as well as other types of symbolic communication (e.g., verbal, pictures, signs). It can also be especially valuable for oral-motor work and related expressive language challenges. Three or more individual sessions per week of 30 to 60 minutes each is often required, in addition to consultation to and integration with the home and educational program. (See Gerber & Prizant, Chapter 5, and Madell, Chapter 6, this volume, for further discussion.)

Occupational and Physical Therapy

Occupational and physical therapy are especially helpful for motor problems, motor-planning and sequencing difficulties, and sensory modulation and processing challenges. Two to three individual sessions per week of 30 to 60 minutes each is often required, in addition to consultation to and integration with the home and school programs.

There is often confusion between very helpful clinical strategies that foster sensory modulation, muscle tone, and motor planning and debates about the explanatory value of sensory integration theory. Like all broad theories, time and continuing research will be needed for further refinement of sensory integration theory. In the meantime, clinical techniques that enable children to master functional developmental capacities should be employed based on their clinical usefulness. (For further discussion, see Williamson, Anzalone, & Hanft, Chapter 8; Long & Sippel, Chapter 9; Koller, Chapter 11; Wachs, Chapter 20; Youssefi & Youssefi, Chapter 21; Feuerstein, Chapter 22, this volume.)

Educational Program

An educational program should be geared to a child's functional developmental capacities and processing profile and must involve developmentally appropriate practices for children with special needs. For example, some programs attempt to have a child learn in a group even though the child requires a highly individualized approach. Often, children are able to learn in groups only after they have advanced to the point of mastering individual relationships and preverbal problem-solving interactions and are already beginning to use words. Nonetheless, school settings with other children can be very enriching, even if initially most of the work is conducted on an individual basis. Gradually, learning can move more toward group interactions.

A child who is not yet engaged or purposeful needs to be involved in one-on-one interactions with a teacher, aide, or volunteer throughout most of the school day. The aide's role is not to sit behind the child or help the child conform to noninteractive routines, but rather to "woo" the child into learning interactions (i.e., two-way purposeful interactions

and a constant flow of back-and-forth communication). Once a child progresses to purposeful gestural communication, complex imitation and, over time, to using symbols (e.g., words, pictures, and signs) and is able to relate to and communicate logically with peers, two-way symbolic interactions need to be facilitated to promote logical thinking. As a child becomes more logical and abstract, group learning and routine academic activities can provide constructive learning opportunities. This stage, however, is the culmination of a long learning process.

Many programs are not equipped to provide the needed one-on-one interaction for most of the school day, which is required by the child who has not yet fully learned to engage with peers and adults or communicate and problem solve with gestures. In addition, education for children with special needs may take many forms. Often, goals are derived from the academic objectives for older children. When this occurs, there is often little attention given to the sequence by which young children acquire the core functional abilities that will enable them to relate, communicate, think, and learn, including mastering traditional academic tasks. Typically, there is an overemphasis on compliance in a group situation before a child has learned to negotiate one-on-one relationships or even understand simple expectations. For example, a child may be taught in a rote manner to match shapes before she can engage in basic multistep, preverbal, problem-solving interaction sequences, such as getting a toy out of a box, bringing it over, and motioning for an adult to play.

The child who is already attentive, engaged, purposefully interactive, involved in complex, ongoing preverbal problem-solving communication (i.e., gesturing), and is beginning to use words presents special opportunities. She needs to learn to elaborate and build bridges between ideas in a variety of contexts. To meet this goal, the child requires opportunities to interact with peers (one-on-one and in small groups) who are related, interactive, and verbal (often with an adult mediating). She requires an integrated setting or an aide in a mainstream setting.

It is important to emphasize that educational programs for a child with special needs should not comprise a series of disconnected cognitive learning opportunities. The important academic goals just stated do not emerge as isolated cognitive skills by simply practicing them. Having a child sit and look does not mean he understands or that he can learn from listening. Nor does having a child memorize a passage mean he understands it. These skills are part of a progression where each step builds on another. Comprehension, relating, communicating, reading, math, writing, and engaging in higher-level problem solving must build on the six functional capacities described earlier. Education programs should identify where each child is in his unique progression, meet the child at his level, and work on the next steps. *Only this type of logical progression constitutes developmentally appropriate practices for a child in school.*

For example, to read with meaning or to understand math, a child must learn how to:

- *"Want" to attend and engage with others* (first with one person at a time and then a few) in order to be part of experiences that will enable him to discriminate sounds and sights necessary for reading and math, and to eventually give words and quantity concepts meaning.

- *Communicate logically with simple gestures and affect cues,* and then with complex problem-solving behaviors in order to understand patterns of cause-and-effect relationships and different levels of logic. These capacities are essential for any type of academic work.

• *Represent or symbolize emotional experiences and build logical bridges between them.* What a child knows from preverbal experience as well as new verbal experience must be understood, communicated, and thought about logically with words, pictures, or other symbols. This is necessary for creative and logical thought, abstract thinking, and all academic tasks requiring the comprehension of words or the ability to reason with symbols.

In addition to the difficulties in providing one-on-one interaction, most educational programs, due to administrative policies, change intervention teams for a child and family when the child is 3 years old. For a child with autistic patterns who is learning to relate to and trust others, this change can undermine educational progress. Therefore, continuity of staff and program is critical during the infancy and preschool years.

Developing the most appropriate educational program for children with special needs is extremely challenging and often requires one-on-one or very small group learning. To increase one-on-one learning opportunities that enable children to climb the developmental ladder and eventually learn and communicate in groups, school programs should provide more aides and allow parents to volunteer, as they do in cooperative preschools. (See Wieder and Kalmanson, Chapter 13, this volume, for further discussion.)

Children with learning and attention problems who have progressed and mastered their basic challenges in relating and communication, as well as children who have already mastered these skills but have problems with attention, learning, or both, require an educational program that provides opportunities to resolve specific processing challenges and progress to high levels of abstract thinking and academic proficiency. Promising techniques

to strengthen processing capacities such as visual-spatial, auditory, and motor planning are being developed and are available in innovative schools and programs but are not yet sufficiently available in all education and special education programs. (See Miller and Eller-Miller, Chapter 19; Wachs, Chapter 20; Youssefi & Youssefi, Chapter 21; Feuerstein, Chapter 22; and Bell, Chapter 25, this volume.)

In addition, many intelligent children with moderate to severe circumscribed learning and/or attention problems who are fully capable of being mainstreamed often require both participation in regular classes and one-on-one and very small-group (two to four children) learning opportunities to master specific processing challenges. Many require special learning opportunities for as much as half of the day, during which they can work on their processing challenges with the most up-to-date techniques. At present, unfortunately, many children with learning and attention problems do not get the adequate time or techniques they require.

Exploration of Biomedical Interventions

Certain children with special needs will benefit from biomedical assessments and considerations of interventions, including medications. For example, medications in the selective serotonin reuptake inhibitor group may facilitate motor planning, sequencing, and attention and reduce perseverative or repetitive behavior. To determine if a biomedical intervention should be a part of the therapeutic regimen, a basic biomedical assessment needs to be implemented, as described by Robinson, Chapter 17, on biomedical approaches.

In exploring a trial of medication, it is essential to look carefully at the side effects and weigh the benefits and risks. Medications

are not designed as precisely as would be optimal and will often affect nontargeted areas. In addition, exceptional caution and close monitoring are required if more than one medication at a time is being considered.

Ongoing Developmental and Family Consultation

In addition to conducting the initial diagnostic evaluation and monitoring progress, developmental specialists (e.g., a psychologist, behavioral or developmental pediatrician, or child psychiatrist) may be helpful in facilitating or coaching the family in constructing developmentally appropriate interactions at home and at school. For some families, this consultation may take the form of regular meetings one or more times per week, during which the therapist works with the parents and other caregivers on their interactions with the child and, if needed, works directly with the child. Consultations may also involve periodic home visits. In addition, intensive family work with supports and coordination from community agencies will be necessary for some families. The form the consultation takes will vary depending on the needs of the child and the family. (For a more detailed discussion, see Greenspan, 1992; Shanok, Chapter 14, this volume)

Family Support and Dynamic Family Processes

Special clinical techniques are often needed to support families. Although there is a long tradition of family-based programs for children with special needs, many of these programs offer only minimal help to the whole family, including siblings. Marital conflicts, misperceptions of the special-needs child or her siblings, and higher levels of stress may characterize the family functioning. It is also difficult for a family to orchestrate an entire

intervention program. Often, various levels of support are needed.

SPECIFIC CLINICAL TECHNIQUES

Specific clinical techniques to deal with difficult symptoms or behaviors are often needed as part of an overall program. There are two primary philosophies that tend to guide parents, educators, and clinicians. The behavioral approach attempts to decrease the target behavior directly by ignoring it, using negative consequences, or both, and attempting to replace it with another behavior supported by positive consequences (e.g., interrupting perseverative behavior and insisting on and reinforcing another activity). Intensive behavioral approaches are often suggested as an overall treatment method. Although they have a circumscribed role for selected children, they do not address many important functional capacities, including the capacity to relate with pleasure and warmth, to connect affect or intent to motor planning and emerging symbolic capacities (for creative and reflective thinking), and to process sensory information and plan actions.

Although behavioral approaches are widely used in most communities, as indicated in Chapter 3, children with typical patterns of autism who are in these programs generally do not make clinically meaningful progress. They are often unable to learn to live independently, work, and participate in a range of age-expected social relationships. (See, Chapter 3; and Tsakiris, Chapter 31, this volume, for a full discussion.) Nonetheless, specific behavioral exercises can be useful for a child who has severe motor-planning problems and, therefore, is having difficulty learning to imitate actions, sounds, and words. When the child can begin using imitative capacities at the moment he is trying to solve a problem, such as copying the act of opening

a door to get out, or saying "up" to get his toy from a high shelf, he can move into more dynamic, interactive learning approaches. Therefore, as one part of the semistructured component of a broad comprehensive program, some children may, for a period of time, require behavioral exercises in conjunction with dynamic, interactive work.

Intensive behavioral intervention techniques by themselves tend to be almost antithetical to harnessing the child's natural affect and intent as a basis for internal control and initiation of behavior and language. They have as their strength the external control of behavior through external discriminative and reinforcing stimuli (prompts and reinforcers). External control can help get some behaviors started. While there has been the hope that internal prompts and reinforcers can take over as part of a generalization process, the child does far better if she can learn new behaviors and concepts under the influence of internal affect cues. These give her actions immediate meaning and direction.

Intensive behavioral intervention techniques can be compared to the strategy of a tennis coach using hand-over-hand learning. In this approach, the coach holds the racket with the student and drops the ball in front of the student *only* when teaching a difficult, new handgrip or stroke. Most of the learning occurs either through playing actual games or in dynamic drills where the student is learning to use his forehand or backhand while on the run. The behavioral strategy is similar to the hand-over-hand approach because a therapist uses it temporarily to shore up a skill such as imitative capacities. Once the child reaches a certain level, however, most of the learning needs to occur in the semistructured learning situations (such as the dynamic tennis drilling) and in the spontaneous learning interactions (such as playing games). The more structured approach would remain

available on an as-needed basis. In this way, behavioral strategies are part of the tactics that are available to the clinician.

Interestingly, developmentally appropriate practices can be conceptualized in behavioral terms. In this model, the focus is on developmental processes (i.e., classes of behavior), such as creative, ongoing reciprocal interaction (circles of communication) rather than on specific behaviors, such as "looking." The processes selected for focus are from a hierarchy of developmental capacities that need to be mastered. The cues (discriminative stimuli) and reinforcers are based on internal affect states rather than on external events (i.e., natural social cues and reinforcers). Interactions are continuous rather than stop-start. Some intensive behavioral approaches are moving toward such a developmentally based model (e.g., Pivotal Response Training [(Schreibman, Stahmer, & Pierce, 1996]).

The functional, developmental approach attempts to understand the broad category of functioning that the worrisome behavior is part of, and the broad functional categories that may be missing. In this context, functional means a broad developmental capacity essential for the child's progress, such as purposeful gesturing or using ideas. It does not refer to a narrow functional behavior, such as dressing. Developmentally appropriate interactions and practices are used to help the child master new functional capacities. For example, repetitive opening and closing of a door is part of the larger category of repetitive and rigid ways of dealing with the world. The missing functional category is the developmentally more advanced capacity for flexible, creative interactions in the world. In this model, the worrisome, repetitive behavior serves as an opportunity for progressing to higher functional developmental levels of flexible, creative interactions. Therefore, as described earlier, a perseverative behavior,

such as opening and closing a door, is turned into a purposeful interaction. The functional developmental approach keeps the larger therapeutic goal of higher-level functional developmental capacities in the forefront.

Both philosophies can be used in an integrated manner. For example, a caregiver can interrupt a child's self-injurious behavior while simultaneously drawing him into interactions that serve a similar sensory need, such as deep tactile pressure coupled with warm engagement and two-way intentional communication.

SUMMARY

This chapter reviewed the general clinical principles that characterize a functional developmental approach to assessment and intervention. The chapters that follow review intervention research, examine the evaluation and intervention process for each functional area, and explore the evaluation and diagnostic process as well as the intervention process in more detail. Relevant neuroscience research also is considered.   ■

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Ambulance Victoria Clinical Practice Guidelines for Ambulance and MICA Paramedics. 2018 Edition. VERSION HISTORY.Ä Mx principles. - Oâ„ is a treatment for hypoxaemia, not breathlessness. Oâ„ has not been shown to have any effec on the sensation of breathlessness in non-hypoxaemic patients.Â of assessment Paramedics should provide for a patient. If it cannot be achieved or is deemed clinically not necessary, the rationale should be documented by the treating crew. â€¢ The minimum standard of care for patients being transported by AV is 15 minutely vital signs assessments, to allow monitoring of trends and early identification of the deteriorating patient. If this isnâ€™t possible or is deemed clinically unnecessary the rationale should be documented. 1. Clinical Practice Improvement (CPI) â€" a description of the model used to improve processes of care and service delivery. 2. Quality improvement tools and techniques â€" a guide to choosing and using the most appropriate tools and techniques for various stages of the improvement process. If a single incident, sentinel event or near miss is identified, and is of significant severity, then a â€˜Root Cause Analysisâ€™ (RCA) should be undertaken.The method for this process is outlined in The Easy Guide No.2 â€" A Guide to Sentinel Event Management.Â identification of a number of interventions that may reduce the problem, implementation of the intervention(s) and re-measurement to ascertain whether the interventions have been effective. The Clinical Practice Improvement Model. 2. Only RUB 220.84/month. Principles and Practices of Assessment and Intervention. STUDY. Flashcards.Â 1. to identify skills taht a person does/ do have w normative comparisons, 2 intervention planning- short and long term objectives, who what?, and goals. 3. Montior changes overtime, qualify a person of service. 4. quality a person for services (elidgability. 5 steps and scope of communicative assesment. 1. Screening and referral, 2. designing and administering 3. Interpret results of assesment 4.Develope TX plan 5.monitor progress and outcomes. Dynamic Assesment. Participant model of observation - repeat and try new things. Intervention Planning. Introduction. Implementation and use of clinical practice guidelines. Key/codes explanation. Clinical practice guidelines - index.Â CPGs presume no intervention has been applied, nor medication administered, prior to the arrival of the Practitioner. In the event of another Practitioner or Responder initiating care during an acute episode, the Practitioner must be cognisant of interventions applied and medication doses already administered and act accordingly. In this care continuum, the duty of care is shared among all Responders/ Practitioners of whom each is accountable for his/her own actions.Â Decisions to give analgesia must be based on clinical assessment and not directly on a linear scale. Yes or best achievable. Adequate relief of pain. Good Clinical Practice (GCP) is an international ethical and scientific quality standard for designing, conducting, recording and reporting trials that involve the participation of human subjects. Compliance with this standard provides public assurance that the rights, safety and well-being of trial subjects are protected, consistent with the principles that have their origin in the Declaration of Helsinki, and that the clinical trial data are credible.Â The principles established in this guideline may also be applied to other clinical investigations that may have an impact on the safety and well-being of human subjects. ADDENDUM. Since the development of the ICH GCP Guideline, the scale, complexity, and cost of clinical trials have increased.