Occupational Therapy
Treatment Practices
With Infants in Early Intervention

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This paper explores occupational therapy treatment practices for infants (birth to age 2 years) in early intervention programs. Generic treatment is viewed as the facilitation of the infant’s independence through improved motor control, sensory modulation, adaptive coping, sensorimotor development, social–emotional development, daily living skills, and play. Treatment practices in specialized settings, that is, in a neonatal intensive care unit and in a follow-up program for high-risk infants, are outlined. The efficacy of intervention is discussed in light of recent research findings and of the comments made by critics of early intervention.

Generic Practices

The occupational therapist, as a member of an interdisciplinary team of health and education professionals and parents, facilitates independence in infants by enhancing motor control, sensory modulation, adaptive coping, sensorimotor development, social–emotional development, daily living skills, and play.

Motor Control

Motor control, or the ability to use the body effectively, gives the infant a means of mobility, of exploring the environment, and of communicating before speech is developed. Because of its influence on the development of other systems (i.e., social, cognitive, emotional), motor control is often at the root of many treatment interventions.

Neurodevelopmental treatment, developed by Bobath (1967) to influence motor control in children with cerebral palsy, is a widely used interdisciplinary treatment approach (Bobath, 1967; Scherzer & Tscharnuter, 1982; Stern & Gorga, 1988). The application of neurodevelopmental treatment to infants was made possible by the work of Mary Quinton and Elisbeth Kong in Bern, Switzerland (Kong, 1966). In “baby treatment,” the therapist identifies how and why an infant’s movements are obstructed and by what movement patterns or compensations (Bly, 1983). The objective of treatment is to improve the quality of movement and functioning of the infant.
Adaptations are particularly effective when they meet the parents' goal, such as easing the handling of the infant. For example, for an infant with difficulty maintaining a proper seated position, a seating device may be designed to meet this goal. Adaptations are particularly effective when they meet the parents' goal, such as easing the handling of the infant.

The role of the occupational therapist who uses the neurodevelopmental treatment approach is usually determined by a combination of factors, including the philosophy of the treatment program, the functions of the other team members, and the knowledge and expertise of the individual occupational therapist. For example, the occupational therapist's contribution to the team may be one of integrating other areas of development into treatment (e.g., integrating play into sensory modulation).

Sensory Modulation

Sensory modulation, or the ability to regulate the sensory processes needed to maintain a state of equilibrium, is an integral part of the infant's treatment. Dysfunction in sensory processing and its effect on learning and behavior in the school-age child has been discussed by Ayres (1979), de Quiros (1978), and Ornitz (1974). Although conceptual aspects of these authors' theories can be applied to infants, little has been published on sensory modulation and infants. Most applicable to infants are the concepts of sensory registration, arousal, and attention. These concepts provide a theoretical basis for adaptive and maladaptive motor or behavioral responses. Sensory registration is the initial awareness of a change in the environment. This change results in arousal. The infant turns toward the stimulus to gather information. This results in attention to the environment. Learning is then possible. A maladaptive response can result from a breakdown along any point in this sequence (i.e., sensory registration, arousal, orientation, attention, learning). The appropriate timing, intensity, and duration of the designated sensory inputs can facilitate this sequence and produce the developmentally appropriate response.

Therapists can also draw upon the work of Als (1986), who formulated a synactive theory of development and an assessment of premature infants' behavior. Als identified the differentiation and modulation of behavioral subsystems. For each subsystem, according to Als, there are signals of stress or stability that describe the infant's approach and avoidance behaviors toward environmental stimuli. By identifying stimulus thresholds that allow the infant to stay well modulated, one can give the infant individualized care.

Sensory modulation is essential for well-developed functioning in other areas (i.e., motor control, social interaction, cognitive performance); however, the implications for the assessment and treatment of sensory modulation have not been systematically studied and reported by clinicians experienced in this area.

Adaptive Coping

Williamson and Zeitlin (in press) described treatment strategies to enhance the infant's coping, a process of caring for oneself and responding effectively to the demands of the environment. The infant reacts to demands by using either learned or new strategies, and the environment then responds to the infant's coping effort. The goal of the treatment is to make a better fit between the infant and the environment by changing the demands on the infant to fit his or her capabilities, by enhancing the infant's developmental skills and coping resources, and by changing the environment's response to the infant (Williamson, 1988; Zeitlin & Williamson, 1988). This adaptive coping approach is not used in isolation but is integrated with other areas, such as motor control, social-emotional development, and the acquisition of developmental skills.

Sensorimotor Development

Many therapists incorporate the cognitive theory proposed by Piaget to facilitate sensorimotor development in the early years (Piaget & Inhelder, 1969). Treatment strategies include the use of play materials and attention to the social interactions between parent and child and therapist and child to stimulate concept formation, memory, and problem solving. Because Piaget's theory addresses cognitive development, and not treatment, therapists include in treatment principles of learning theory and the knowledge of environmental influences on cognitive development (Lipsitt, 1986; Sameroff, 1986; Yarrow, Rubenstein, & Pederson, 1975).
Social–Emotional Development

Like adaptive coping, social–emotional development is interwoven into other treatment concerns. Greenspan (1988) discussed the importance of attending to the emotional needs of infants and their families in the context of the treatment of motor or intellectual deficits. He provided the clinician with an understanding of adaptive and maladaptive patterns of emotional development, experiences that facilitate emotional growth, and principles to guide integrated treatment. For example, infants develop the ability to regulate their internal states and, consequently, develop an interest in the world. When an infant has a motor deficit that prevents self-comforting, the therapist can teach parents ways to hold and move the infant so as to facilitate both the gaining of motor control and the feeling of comfort.

Daily Living Skills

Feeding is the major focus of daily living skills in infants. Feeding is an extremely important time for both the infant and the parent, because it involves a major portion of the infant's time in the early months; it provides the possibility for emotional attachment and sensory input; and it is a major force in physical growth. Feeding deficits can be biologically or psychologically based and are often complex (Denton, 1986; Humphrey, 1987). The provision of the appropriate feeding environment to promote the development of feeding skills often requires the integration of other treatment areas, such as motor control, adaptive coping, social–emotional development, and sensory modulation. Therapists use strategies to facilitate motor control through handling, positioning, and adaptive devices (Morris, 1982, 1987). The therapist can address adaptive coping and social–emotional concerns during feeding by analyzing the infant's behavioral cues, detecting sources of distress, and altering the environment to reduce the distress (Levin, Walker, Gorga, O'Loughlin, & Nagler, 1988). When the infant's feeding is affected by poor modulation of sensory input, the therapist can guide the parents in grading their input to a level that is acceptable to the infant.

Play

Among the various ways in which play can be conceptualized and applied in treatment, two dominant viewpoints have emerged: play as a purposeful activity, that is, as a tool to enhance the development of various skills or levels of development (Hinojosa, Sabari, & Rosenfeld, 1983), and play as a developmental category in which children develop specific behaviors in a predictable sequence related to how they play (Florey, 1981). These viewpoints are not mutually exclusive, however, because to use play in treatment, therapists draw on their knowledge of the developmental expectation of play behavior.

The occupational therapist's challenge in incorporating play into treatment is to balance goals in the various treatment categories (Anderson, Hinojosa, & Strauch, 1987). For example, for a spastic, diplegic infant whose muscle tone increases with effort as he or she plays, the therapist can use methods to influence tone without hampering the infant's curiosity, motivation, and exploration. Alternatively, the therapist can facilitate cognitive and social development without encouraging abnormal movement patterns. Clinical judgment is required to maintain a realistic balance of treatment goals in light of the infant's total needs.

Practices in Specialized Settings

Generic treatment practices can apply in any setting; however, specific practices exist in the specialized setting of the neonatal intensive care unit (NICU) and in the follow-up of high-risk infants after discharge.

Neonatal Intensive Care Unit

Follow-up studies of infants treated in an NICU during the perinatal period have indicated that neuromotor and developmental problems prevailed in 10% to 25% of the infants (Asbury, Orgill, Bajuk, & Yu, 1983; Coolman, Bennett, Swanson, Andrews, & Robinson, 1985; Stave & Ruvalo, 1980). As it became more apparent that some of these infants were at risk for subsequent problems, the clinicians and researchers questioned the negative influence of the intensive care experience. Thus, intervention in the NICU was aimed at fostering a climate for developmental growth with the ultimate goal of preventing later developmental problems (Bennett, 1987; Holmes, Reich, & Pasternak, 1984).

In this highly specialized treatment area, occupational therapy practice can be conceptualized in two ways: as an environmental approach and as a clinical approach. These approaches are used either together or separately, depending on the philosophical framework of each NICU or the level of participation of the occupational therapist. The environmental approach is based on the philosophy that all infants in an NICU require a systematic plan for organizing their environment. The premise is that these infants, particularly premature infants, are, on one hand, sensorially deprived because of their premature birth and, on the other hand, sensorially bombarded because of the nature of the medical intervention in the NICU (Turkewitz & Kenny, 1985). These infants need gradual sensory input and handling that has been modified to their individual responses (A1s, 1986; Lawhon, 1986).
There is a shift away from the use of a general infant stimulation approach and toward the use of an individualized plan of sensory input and adaptive responses based on the specific needs of the infant.

The clinical approach is also specific to the needs of the infant; however, it is used when the infant has observable problems such as inadequate and inefficient nipple feeding, deviations in muscle tone and posture, or disorganized behavior (Anderson, 1986; Anderson & Auster-Liebhaber, 1984; Case-Smith, 1988; Pelletier & Palmeri, 1985; Stern, 1986). After assessing the infant, the therapist develops handling and feeding strategies with the nurses and parents. The therapist can be instrumental in alleviating the parents’ fears of holding and interacting with their infant by guiding them in handling the infant and in observing the infant’s behavior and reactions.

Follow-Up of High-Risk Infants After Discharge

As an outgrowth of treatment intervention in the NICU, the screening of high-risk infants in a follow-up program is essential to monitor the infant’s development and to identify the need for a referral to an early intervention program (Stern, 1987). Fundamental to a developmental assessment for high-risk infants is an understanding of the particular course of neuro-motor and behavioral development of premature infants in the first year of life. Research findings indicate that some premature infants differ from full-term infants in quality of movement, muscle tone, and types of movement patterns (Gorga, Stern, & Ross, 1985; Gorga, Stern, Ross, & Nagler, 1988). The responsibility of the therapist and the other members of the interdisciplinary team is to determine which infants need intervention and which infants will resolve their problems over time.

In addition to developmental screening, another component of a follow-up program may be a short-term intervention—the provision of guidance and reassurance to the family in facilitating development in their infant. For those infants who exhibit slight deviations in development but do not warrant a structured early intervention program, the therapist can offer suggestions for home management.

Efficacy of Treatment in Early Intervention

Critics of early intervention challenge therapists to verify their treatment practices. Ferry (1981) questioned treatment effectiveness in the absence of positive research conclusions, whereas Deahoff (1981) supported early intervention and stated that the benefits outweigh the disadvantages. Taft (1981) concluded from his clinical observations that early intervention improved parent-child interaction, motivation, parental adaptation and coping, and the child’s happiness. The consensus among professionals and families is that gains are made through treatment (Shonkoff & Hauser-Cram, 1987); however, current research has not supported this position.

Few research studies have investigated the effects of occupational therapy in early intervention (Carlson, 1975; Hourcade & Parette, 1984; Parette & Hourcade, 1984). Most of the studies have focused on the child’s global outcome (i.e., achievement of developmental milestones and of increased scores on IQ tests or other developmental measures) as a result of a variety of interventions (Guralnick & Bennett, 1987; Holmes et al., 1984). Specific techniques have been tested, usually involving an interdisciplinary approach (Ottenbacher et al., 1986). In the aforementioned studies, it is difficult to interpret the specific treatment effect of occupational therapy because the treatment cannot be separated from other interventions with the infant and family.

A number of recent early intervention studies have raised important issues concerning the efficacy of intervention. Piper et al. (1986), Palmer et al. (1988), Goodman et al. (1985), and Resnick, Eyler, Nelson, Eitzman, & Bucciarelli (1987) defined improved motor abilities as one aspect of positive outcome. With the use of standardized developmental tests to measure performance, these studies (except for Resnick et al.) showed little or no gains in motor outcome in the experimental group. Aside from the methodological difficulties inherent in behavioral research, we need to consider the implications of these studies. We cannot be discouraged by the findings, but rather, must learn from them. Is it sufficient to consider positive outcome as improved scores on a developmental test? Is this the goal of early intervention? If the desired outcomes are enhanced motor control, adaptive coping, sensory modulation, social-emotional and sensorimotor development, and daily living skills in the context of the family, should not all of these outcomes be measured?

The documentation of treatment effectiveness is possible. The application of the single-subject research design enables the clinician to transform information collected as part of a progress report into a systematic approach for research. DeGangi, Hurley, & Linscheid (1983) described the use of the single-subject design in their study of the short-term effects of neurodevelopmental treatment, and Campbell (1988) described its application in the school setting.

Conclusion

With the advent of changes in public policy in early intervention and the surge of new research, the time is right for occupational therapists to work toward an
interdisciplinary effort in the study of treatment effectiveness. We must define and measure outcomes that are sensitive to changes through intervention and document improved function and quality of life for infants and their families. The emphasis of research should shift from answering the global question, Is early intervention effective? to more specific questions that have practical ramifications, such as, What type of intervention with what kinds of effects for which type of children in what type of family? (Shonkoff, 1989). By considering the individual differences among children and their families, we can begin to document treatment effectiveness.

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References


