The integration of play activities with neurodevelopmental treatment (NDT) can be a challenge even for the experienced occupational therapist. A primary goal of occupational therapy in treating children with cerebral palsy is to promote normal patterns of movement and prevent abnormal postural reactions while the child is engaged in functional, purposeful activities.

Treating a child with cerebral palsy often involves a variety of treatment techniques and methodologies from several theoretical frames of reference. Occupational therapists in pediatrics commonly use the neurodevelopmental therapy frame of reference, which involves the use of specific handling techniques to facilitate normal muscle tone, patterns of movement, and automatic responses. When NDT principles are integrated into occupational therapy intervention, the therapist must have a basic understanding of the tonal and movement characteristics of each type of cerebral palsy, specific handling techniques, and the performance components of developmentally appropriate activities.

Integrating play activities with NDT can be difficult. It is a complex task to try to elicit specific responses through handling while simultaneously engaging the child in purposeful play activities. Unsuccessful attempts to integrate play with NDT may be frustrating and may result in a limited use of activities during occupational therapy intervention.

This article discusses some of the issues involved in combining play with NDT and offers selected activity solutions. The authors believe that play interaction with children with cerebral palsy is generally compatible with the application of NDT principles. However, we recognize that the integration of activities involving specific play materials, objects, and manipulative or motor skills may not always be possible.

Review of the Literature

The occupational therapist's unique use of play as a therapeutic activity involves the reconceptualization of play as a purposeful activity (Hinojosa, Sabari, & Rosenfeld, 1983). Play is an action on human and nonhuman objects that is engaged in for its own sake. Florey (1981) has identified six principles of play common to many theories: Play is a complex set of behaviors characterized by fun and spontaneity; play is sensory, neuromuscular, mental, or a combination of these three; play involves repetition of experience, exploration, experimentation, and imitation of one's surroundings; play integrates the child's internal and external world; play permits the child to rehearse his or her interpretation of reality and fantasy; and play follows a sequential, developmental progression. Thus, play activities develop the skills that will allow
the child to interact with the demands of his or her environment.

There is agreement in the psychoanalytical literature on two points—that play has a central role in a child's development and that the inhibition of play in childhood has severe pathological implications ( Erikson, 1950; Pellar, 1954, Winnicott, 1971). When the natural drive to play is thwarted during therapy, the young child may become distressed. Older children may lose concentration and repeatedly ask when therapy will be finished or may become less cooperative, more resistant, and manipulative.

From a psychoanalytic perspective, play helps children achieve instincual satisfaction by creating substitutes that permit emotional expression (Plaut, 1979). A bright, socially interactive, 15-month-old infant with spastic diplegia appeared to have a "psychological need" to constantly manipulate objects and exercise control over play materials during therapy. This upper extremity play may be a substitute for gross motor exploration and independent ambulation. The play also provided her with control over her environment and possibly fulfilled her needs for autonomy—needs that are characteristic of the separation-individuation process.

Play facilitates mastery over anxiety by active rather than passive means. When this same 15-month-old child was first positioned in a supported standing position in inhibitory casts, she appeared distressed and fearful. She tolerated the lower extremity weight bearing and calmed when her favorite play materials were presented.

Handicapped children follow a developmental play sequence similar to the sequence followed by normal children, but sometimes at a delayed rate (Field, Roseman, De-Stefano, & Koewler, 1982). An 8-year-old developmentally delayed child required the use of dramatic, interactive play typical of the preschool period to meet her developmental play needs during therapy. Imaginative play progressed from symbolic play with animals to role play with human figures during the course of 1 year. The primary goal for this child was to facilitate normal motor development and the acquisition of fine motor skills.

The NDT frame of reference, an interdisciplinary therapy approach, focuses on the normalization of tone and the integration of primitive postural patterns into the development of normal postural responses and movement patterns (Smith, 1984). Therapists evaluate the quality of the child's movement, developmental milestones, skills, movement sequences, and postures (Stengel, Attermeier, Bly, & Heriza, 1984). To establish an appropriate goal for the child, occupational therapists identify movement components required to achieve a functional goal (Boehme, 1985). Through handling and movement, appropriate automatic reactions are elicited to achieve functional goals (Scherzer & Tscharnuter, 1982).

One goal of NDT is to produce automatic movement patterns without placing conscious attention on the process. Historically, occupational therapists have selected, used, adapted, and synthesized activities in their treatment. A child absorbed in play is not focused on the motor demands inherent in the activity. Through motor analysis, activity (play) integration, problem solving, and facilitation of normal tone and movement, occupational therapists address the specific developmental needs of the child (Smith, 1984).

Issues in Play and NDT

A primary objective of the NDT certification course is to refine observation skills while developing handling techniques through facilitation labs and hands-on clinical practice. The course does not tend to focus on play activity integration, possibly because of time constraints. Participants are expected to synthesize NDT concepts in their particular domain of concern and into future clinical practice. Because the emphasis in the NDT course is on handling and normal motor development, potential conflicts may arise when occupational therapists try to integrate purposeful goal-directed activities into NDT.

Traditionally, occupational therapists are expected to effectively use activities in treatment. Many therapists who complete the NDT certification course may experience role conflict if they perceive NDT strategies as inconsistent with occupational therapy treatment approaches. Aside from perfecting handling skills, occupational therapists may feel that they must also master the integration of activities with NDT. To develop and perfect handling methods with a specific child while providing relevant play experiences may create additional challenges. These complex practice issues may be resolved in a variety of ways. Therapists who specialize in NDT may disregard the notion of combining play activities as a "personal philosophy of practice" and concentrate primarily on handling techniques. Others may limit handling and focus more on positioning while facilitating the development of specific skills through activities. Therapists may also alter the activity and NDT emphasis with different children or during treatment sessions depending on the child's specific needs.

Occasionally therapists have difficulty integrating play activities and may feel they have compromised their occupational therapy roles. However, because of the sophistication of skills required to integrate play with NDT, certain difficulties may be inherent in the treatment process. Positioning the play activity while simultaneously handling the child can be a difficult, almost impossible, task with some children. Handling
techniques are modified according to the child’s responses during movement sequences, and therapists constantly analyze the child’s reactions to determine the effectiveness of handling methods. The addition of a play activity creates another component for the occupational therapist to plan, integrate, and monitor in an already demanding treatment situation.

During the child’s treatment, the therapist may need periods of time to select, organize, and change activities. Unfortunately, the child’s attention or normalized muscle tone and posture may be lost during these periods. The efforts of a child with cerebral palsy to participate in activities may also cause associated reactions and abnormal postures that conflict with the NDT approach. Thus, highly developed observation and handling skills are essential to coordinate all aspects of treatment. The sophistication and complexity of this intervention process is often not recognized by occupational therapists and other professionals.

**Intervention**

Because of their motor impairment, most children with cerebral palsy cannot fully participate in many play activities. Incorporating play within NDT has many benefits and can fulfill a variety of therapeutic goals: (a) to develop specific cognitive and perceptual skills, (b) to provide appropriate activity experiences as stimuli for normal movement patterns, and (c) to motivate the child for intervention that supports normal developmental needs. Play activities may satisfy both the goal of the child to participate with his or her world and the therapeutic goals of the therapist. There are a number of ways of adapting and integrating activities with NDT.

**Activity Adaptation**

Activity adaptation is inherent in the effective use of play activities and involves (a) adapting the size, shape, or consistency of the equipment or materials used, (b) modifying the rules and procedures, (c) adjusting the position of the child, materials, and/or environment, and (d) controlling the nature and degree of interpersonal interaction. Thus, play activities are continually modified to meet the changing needs of the child. Using play activities while handling a child involves continuous analysis and adaptation of the activity. If the motor demands placed on the child are high, the cognitive demands of the activity may have to be lowered accordingly. Behavioral changes and the child’s emotional responses to activities and treatment influence activity choice, adaptation, and integration. Activities must be meaningful and purposefully incorporated into treatment sessions.

The occupational therapist draws from the knowledge of activity analysis and grading to adapt activities. By using activity analysis, the therapist identifies the critical aspects of the activity related to the individual child and NDT goals. The two processes involved in this analysis are an assessment of the motor, cognitive, perceptual, and psychosocial needs of the child and an evaluation of the components of the activity. The specific NDT equipment needs of the child are also considered. A mobile (therapist lap, ball, or roll) or nonmobile surface is selected to meet the therapeutic goals. Having analyzed both aspects, the therapist is challenged to provide the appropriate play activity while incorporating NDT techniques. Each element or characteristic (size, shape, etc.) of the activity and the type of play (dramatic, games with rules, etc.) may be modified to meet the specific needs of the particular child. For example, if a 5-year-old girl with severe spasticity in both her upper and lower extremities and normal intelligence and language wants to play with the doll house, the therapist first needs to analyze the various components involved in playing with the doll house. In this case, the activity analysis may lead to adapting the activity by changing the location of the doll house, the child’s postural demands, or the manner in which the child will manipulate the objects.

**Issues in Intervention**

The successful integration of activities depends on an appropriately structured physical environment with the activity at the correct height and distance. Lack of equipment or environmental restrictions (e.g., home and school settings) can complicate integrating play activities in treatment.

Two factors that influence activity choices are the neurodevelopmental goals (i.e., techniques and sequences used with the specific child) and the therapist’s own body mechanics and coordination. During treatment, the therapist must be prepared to move with the child in a dynamic interplay. Therapists must be mobile in their positioning and, therefore, use postures that facilitate their own movement as well as that of the child. Assisting a child onto a roll may be difficult for a therapist who is in a tailor sitting position. During dynamic movement sequences, less complicated play activities may be indicated.

Therapists adapt the degree of movement within a given activity and also the sequence of movements. Therapists may select static or dynamic positioning. For example, the child with severely involved, left hemiplegia may need to sit on a stable surface to perform a puzzle or other perceptual motor activity. When side-sitting and reaching with the affected arm this child experiences movement in a different way.
A therapist may even use more than one frame of reference with regard to motor deficits but also require treatment for cognitive or perceptual deficits. It may at times be necessary during treatment for the therapist to find a balance between the child's ability to participate concurrently in movement sequences and play activities. Efforts to promote one aspect may lead to loss of control of another aspect.

Skill Development

Developing specific cognitive and perceptual skills in a child while actively handling the child can be a complex process. The child with delays in both motor and perceptual spheres may be unable to participate in treatment sequences that demand a combination of these skills. The therapist must prioritize goals both in treatment planning and during the treatment session. A previously planned activity may be abandoned or modified when the child is unable to successfully participate or when the treatment objectives cannot be achieved with the activity.

Occupational therapists may use a variety of theoretical frames of reference with the same child. For example, the child may benefit from the NDT frame of reference with regard to motor deficits but also require treatment for cognitive or perceptual deficits. A therapist may even use more than one frame of reference during a treatment session either simultaneously or sequentially. For example, the treatment of an 8-year-old child with mild spastic athetosis and visual perceptual deficits involved selected visual motor tasks during upper extremity activities to promote proximal shoulder girdle control. Because efforts to combine higher level visual motor tasks during movement caused excessive distract, this sequence was followed with a more sophisticated visual motor task on the table.

Motivational Use of Play

Creative and innovative use of play materials, the environment, and use of the self as a play agent are the critical aspects in the effective integration of motivational play with NDT. The child's play interests and capabilities have an extremely important role in activity selection. Although other disciplines use activities for motivation during NDT, occupational therapists' educational background and clinical expertise with play provide a solid foundation for play intervention. One of the unique contributions of occupational therapy is the adaptation of developmentally appropriate activities to meet the specific neuromuscular needs of the child.

The use of current play materials and activities may have an impact on the success of play during therapy. Popular and contemporary activities and the broad spectrum of play interests (i.e., games, television shows, computers, technology, and humor) are important both in activity selection and in interaction with the child. Battery-operated toys may be adapted with various kinds of on/off switches for the severely impaired child with cerebral palsy. Less impaired children may respond to electronic toys and technological devices, including toys that speak, respond to touch, light up, or move, as well as academic learning toys and computers.

Movement is an important aspect of the child's developmental process and play repertoire from infancy onward; for example, the 8-month-old rocks on all four extremities in the quadruped position, the 18-month-old climbs on and off chairs, or the 8-year-old rolls down a hill. Developmentally appropriate movements may be considered play activities. Play can be used to encourage normal movement patterns when NDT is applied. By varying upper extremity actions on objects or toys (reaching, throwing, or placing objects), or the posture (sitting, quadruped or high kneeling), and/or the size of the objects, treatment objectives can be met. Upper extremity elongation, trunk rotation, head and trunk positioning, appropriate grasp, or a combination of these motor components may be developed by using play activities as stimuli for movement.

Activities which are simple, organized, and limited in scope allow the therapist to more effectively handle the child while involving the child in play activities. Less complicated activities with fewer positioning requirements are effective and interfere less with handling. With the young infant (birth to 3 months), the therapist's face and voice can be effective play objects to stimulate visual fixation and tracking, thereby facilitating side-to-side rolling while the child lies supine. With the preschool child, simple play materials can stimulate dramatic or imaginary
play. For example, a variety of hats (baseball, fireman, or space helmet) were used with a 5-year-old boy with spastic diplegia. First he was seated on a therapy ball with his shoulders positioned behind his pelvis to develop abdominal control. Lateral weight shifting and rotation were encouraged when he reached out to grasp and switch hats with the therapist.

The repetitive use of an activity with variations during a treatment session can also simplify the activity component. A 2-year-old girl with spastic diplegia had graduated rings placed over her feet as she lay supine. She reached for and stacked the rings while side-sitting and wore them as bracelets when laterally shifting her weight on the roll. For a 5-year-old child with athetosis and normal intelligence, a pretend game of gardening using colored cubes was used throughout the therapy session. While sitting on a roll, the child planted the garden (colored cubes), emphasizing her trunk rotation and upper extremity weight bearing. Kneeling, she harvested the vegetable garden by placing the vegetables on a small table. Moving to stand, she prepared a vegetable soup, mixing the blocks while holding on to a large spoon with both hands.

Age-appropriate toys and activities are used to encourage participation in treatment. For example, when an 18-month-old toddler straddled a bolster to facilitate rotation and lateral weight shifting, three large dolls were strategically placed on each side of the roll. The child was encouraged to reach out and identify the doll’s facial features. Stuffed animals, an effective alternative to bolsters and wedges for positioning, can also be used as a stimulating material for dramatic play. With a 5-year-old child, small stuffed animals were used to encourage pretend games while the child was standing. Animals were placed appropriately under the feet to facilitate weight shifting in the step position.

School-age children often create games involving rules and competition; the number of seconds a child can stand on the roll while laterally shifting weight can prompt interest and motivation. Playing baseball for a 6-year-old boy with spastic diplegia, while he was sitting on a therapeutic ball to promote lower extremity weight bearing, provided the opportunity to integrate basic motor skills in a developmentally appropriate manner. The ultimate long-term goal for children is to develop skills that will allow them to fulfill their life roles.

Summary
Occupational therapists’ educational background in normal growth and development, therapeutic use of activities, and neurophysiological theory provide the basis for play intervention. Combining clinical experience with NDT and play activities with a willingness to experiment and learn from the child’s responses may result in more creative and appropriate activities. Similar movements, actions, and thought processes during play may facilitate participation in activities of daily living; thus, play activities may support acquiring skills in other areas.

Although this paper has focused on the integration of NDT with play, the issues discussed may arise with other neuropsychological treatment approaches. Activities analysis and adaptation, positioning of the child, and handling methods are all equally important aspects of therapeutic intervention. While considering the realistic physical limitations of the child, therapists encourage the child’s involvement in play activity to develop the child’s physical, cognitive, and psychosocial abilities. Play involves the active participation of the child with his or her environment in a manner that is enjoyable, rewarding, and satisfying. Through play the child with cerebral palsy may explore and discover the world—learn, practice, and become an interactive human being.

References

Related Readings


