

**Module:    Developmentally Appropriate Orientation and Mobility**

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**Session 1: Foundations of Developmentally Appropriate Orientation and Mobility**

**Introduction**

Welcome to Session 1, “Foundations of Developmentally Appropriate Orientation and Mobility,” of the *Developmentally Appropriate Orientation and Mobility* module. In this session, participants will acquire knowledge and skills that will enable them to work collaboratively with families, orientation and mobility specialists, teachers of children with visual impairments, and other early intervention team members. In addition, participants will recognize that sensory, cognitive, and motor development form the foundation for early orientation and mobility, promoting safe and independent movement, exploration, and travel within natural environments for infants and toddlers with visual impairments. Participants will also acquire knowledge about the relationship between attachment and mobility and strategies for fostering independent and safe movement and exploration in natural environments.

**Objectives**

After completing this session, participants will

1. define orientation and mobility (O&M) as it applies to infants and toddlers with visual impairments.
2. describe the history of the field of orientation and mobility and how it relates to infants and toddlers with visual impairments.
3. describe a developmental approach to O&M for infants and toddlers and their families, including family-centered practices, natural learning opportunities, and transdisciplinary teaming.
4. describe components of early orientation and mobility.
5. discuss the roles of orientation and mobility specialists (OMSs) and teachers of children with visual impairments (TVIs) in facilitating sensory development and organization, cognitive development, motor development and movement, and assessment of infants and toddlers with visual impairments.
6. describe the relationship between attachment and mobility and strategies for promoting attachment and trust.
7. discuss the importance of and strategies for fostering independent movement and exploration in natural environments for infants and toddlers with visual impairments.
8. describe the significance of and strategies for providing opportunities for safe movement and exploration.
9. describe protective techniques for early travel and strategies to encourage their use.
10. describe different types of adaptive mobility devices and tools and ways to facilitate their use.

## Major Points

### A. Definitions of orientation and mobility

“The process of teaching travel skills to people who are blind or visually impaired is called orientation and mobility, or in its abbreviated form, O&M” (Anthony, 1993, p. 116). As traditionally defined, “orientation is the process of using the remaining senses to establish one’s position in the environment,” (Hill & Ponder, 1976, p. 3) and “mobility is the capacity, facility, and readiness to move” (Hill & Ponder, 1976, p. 115). When the focus is on early childhood, these definitions are expanded to have closer ties to early sensory, cognitive, and motor development. Development in each of these domains determines how children use sensory information, understand their expanding environments, and learn to move competently within a variety of settings.

Anthony (1993) defines *orientation* for young children with visual impairments as:

knowing oneself as a separate being, where one is in space, where one wants to move in space, and how to get to that place. Orientation skill development involves the child’s ability to use available sensory information, have a basic understanding of his or her location in space, and an awareness of the environmental settings in which he or she will move. (p. 116)

“With very young children, orientation can be tied directly to the cognitive mastery of concepts, body image, spatial constructs, causality, means and ends, and object permanence” (Anthony, Bleier, Fazzi, Kish, & Pogrud, 2002, p. 328). These constructs will be discussed in detail in this module. “In addition, orientation involves the refinement of each individual child’s sensory skills as a means of acquiring information about him- or herself, other people, and the environment” (Anthony et al., 2002, p. 328).

*Mobility* refers to the physical process of moving through space in a safe and efficient manner. “For the very young child, mobility refers to motor development, including the normal integration of reflexes, acquisition of motor milestones, refinement of quality-of-movement skills, and purposeful, self-initiated movement” (Anthony et al., 2002, p. 328). In order to achieve mobility through purposeful, self-initiated movement, young children with visual impairments must be able to orient themselves.

*Chanelle, a 6-month-old infant with bilateral microphthalmia, enjoys exploring objects around her during “tummy time.” She primarily relies on her tactile and auditory senses to orient herself within the environment. Her grandmother, Molly, takes care of her while her parents are at work. Molly sets up a small area in the living room using the couch and the wall to create boundaries and placing her toys in a predictable manner along these boundaries. Chanelle’s OMS had recommended that Molly create these defined spaces to expand Chanelle’s sense of orientation to her environment and to increase opportunities for independence. Chanelle babbles with delight as Molly places her on*

*her stomach in the defined space. After a few minutes of vocalizing and tactually exploring with her hands, she rolls toward the edge of the couch and locates a wooden spoon. Chanelle squeals with delight as she recognizes the spoon.*

## **B. History of orientation and mobility**

The field of orientation and mobility initially did not include young children with visual impairments; however, since the late 1980s young children with visual impairments have had access to orientation and mobility services.

O&M emerged as a field and a profession in the late 1940s (Joffe & Ehresman, 1997) as a rehabilitation process for veterans who lost their vision during World War II. The first university preparation program for orientation and mobility specialists (OMSs) began in 1960 at Boston College.

The initial university preparation programs focused on rehabilitating individuals who had lost their vision as adults; however, the field of O&M quickly began to include an emphasis on children and adolescents. In 1962 the Vocational Rehabilitation Administration awarded 30 grants to 22 states to fund OMSs (Wiener & Sifferman, 1997). By the mid 1960s, the U.S. Office of Education had begun to sponsor university programs that prepared OMSs to work with children and youth who were congenitally blind or visually impaired.

In 1986, federal legislation prompted the field of orientation and mobility to refine intervention for very young children by mandating early intervention and preschool special education for young children with disabilities through the passage of PL 99-457. In 1997, special-education laws were reorganized under the Individuals with Disabilities Education Act (IDEA). Part C of IDEA entitled infants and toddlers with disabilities access to early intervention support and services. In this 1997 revision, IDEA included orientation and mobility as an early intervention service under Part C. Furthermore, under Part B of IDEA 1997, O&M was clearly defined as a related service for children with visual impairments ages 3 through 21. Session 1 of *Family-Centered Practices for Infants and Toddlers With Visual Impairments* (Hatton, McWilliam, & Winton, 2003) discusses the components of IDEA (1997) and mandated services for young children with disabilities and their families.

Concurrently with these events, publications were developed specifically about cane use with preschool-aged children (Hill, Rosen, Correa, & Langley, 1984; LaPrelle, 1996; Pogrud & Rosen, 1989). More recently, there has been an increase in resources available on O&M intervention strategies for preschoolers (Anthony, 1993; Anthony et al., 2002; Dodson-Burk & Hill, 1989; Simmons & Maida, 1992) and infants and toddlers (Anthony, 1993; Anthony et al., 2002; Blind Childrens Center, 1986).

Major Point K (Handout O, *Historical Timeline of Events and Publications Related to O&M for Children Ages 0-5 Years With Visual Impairments*) provides a timeline of the history of the field of orientation and mobility, including information on publications pertinent to very young children.

Orientation and mobility continues to grow as a profession (Wiener & Sifferman, 1997). Over the past 50 years, professionals in the field have revised their teaching strategies to focus on the needs of children. Techniques that were originally designed for adults who were adventitiously blinded have been progressively modified for younger children and for individuals with congenital blindness. Initially, O&M skills were modified for the chronological age of the child, for example, having a preschooler hold onto a guide's wrist or fingers when using the human guide technique instead of holding on to the guide above the elbow. More recently, clinicians have identified early developmental skills that affect the development of orientation and mobility skills. For example, the development of rotational patterns in movement transitions is important for the initiation of movement because children need to be able to rotate their trunks in order to transition effectively out of sitting.

Traditionally, most O&M personnel preparation programs have focused on children between the ages of 3 through 21 years. Because of limited research, resources, and literature on infants and toddlers, it has been difficult for many programs to include significant training specific to early childhood (Fazzi, 1995). However, many OMSs have acquired experience with very young children, especially children between 3 and 5 years of age. Many OMSs who work with children between birth and 5 years have found that a developmental approach is most appropriate for infants, toddlers, and preschoolers.

### **C. Developmental orientation and mobility for infants and toddlers**

Developmental approaches to learning are founded on the theories of Dewey, Erikson, and Piaget. These influential psychologists explained development in terms of biology and the maturation process (Umansky & Hooper, 1998). Thus, development occurs as children are innately motivated to explore their environment and accommodate new experiences and information by modifying their thought processes. OMSs, TVIs, and other early intervention service providers can facilitate the sensory, conceptual, and motor framework needed for independent travel by developing individualized experiences and environments for children with visual impairments. The developmental approach is commonly equated with *developmentally appropriate practice* (DAP), a term adopted by the National Association for the Education of Young Children to describe salient principles of practices in early childhood education. Bredekamp and Copple (1997) describe DAP as being based upon three types of information:

1. knowledge of children's development and learning;
2. knowledge of children's strengths, interests, and individual needs; and
3. knowledge of children's social and cultural contexts.

To implement a developmental approach to orientation and mobility, OMSs, TVIs, and other early interventionists must have a solid understanding of early childhood development. Knowing and understanding the milestones associated with each developmental domain and how to facilitate the acquisition of those milestones allows interventionists to collaborate with families and other team members in identifying and implementing functional goals for the individualized family service plan (IFSP). This background knowledge must be supplemented by information about the impact of blindness and low vision on development (Brown & Bour, 1987; Ferrell, 1998; Hatton, Bailey, Burchinal, & Ferrell, 1997).

### **Family-centered practices and natural learning opportunities**

Optimally, families are integrally involved in child assessment, the identification of functional goals and strategies for intervention, and the implementation of intervention using a developmental approach. Families contribute unique information about their children's development, preferences, and needs. Family-centered practices include respecting and honoring diversity, using a transdisciplinary model of intervention, and embracing naturally occurring learning opportunities within the child's daily routines (Hatton et al., 2003).

Family-centered practices emphasize respect for families' values, cultures, and priorities (Hatton, McWilliam, & Winton, 2002). As part of establishing reliable alliances and effectively implementing them in early intervention, interventionists must respect diversity (Hatton et al., 2002; Turnbull & Turnbull, 2001). Respecting diversity involves recognizing one's personal biases, values, and past experiences and subsequently becoming aware of families' perspectives, priorities, strengths, and concerns. The process of cultural reframing, defined as "an attempt to see or explain a situation from another point of view," is one way of honoring diversity (Hatton et al., 2003).

Orientation and mobility intervention for young children should be embedded into the family's and child's daily routines and activities. As required by IDEA, the IFSP must include a statement specifying the natural environments in which the services will be provided. Noonan and McCormick (1993) broadly define natural environments as "integrated community settings." In other words, team members, working with input from the family about their priorities, should plan interventions during daily routines in the child's home, community park, local playground, childcare center, grocery store, etc. For example, early travel concepts may be taught within the context of a child's eating, dressing, play, and exploration routines. OMSs may work with the family to encourage the child to crawl to the highchair for snack time or to find the bathroom door as the child navigates down the hall to take a bath. In this manner, a number of early skills are addressed in the context of functional and meaningful activities.

*Alicia, a 20-month-old with retinopathy of prematurity, loved to take baths. She smiled and babbled as her mother, Carmen, undressed her and said, "It's bath time, Alicia!" Carmen told the OMS how motivated Alicia was for bath time, and the OMS incorporated the following orientation and mobility goals into the bath-time routine: (a) verifying orientation by the recognition of a known landmark; (b) efficiently moving short distances; and (c) locating a specific landmark, object, or access. As the OMS held Alicia in her arms, she encouraged Carmen to assist Alicia in trailing the walls to and from the bathroom in order to label the various landmarks on the way and give her the opportunity to tactually explore the landmarks. As they reached the bathroom, the OMS suggested that Carmen encourage Alicia to pull to stand by using the edge of the bathtub. Carmen splashed the water to further entice her to pull up. Later, the OMS showed Carmen how she could help Alicia cruise along the edge of the tub to retrieve a favorite bath toy.*

Family routines are valuable natural learning opportunities that promote the attainment of functional outcomes. Functional outcomes (desired goals based on family priorities) enhance children's development and improve the quality of life for children and families (Hatton, 2004). For example, the child who crawls from the hallway to her bedroom toy box has learned to find her own playthings.

*The Davis family enjoys hiking, camping, and skiing as ways to have fun and spend time together. When Amy was 6 months old, she was diagnosed with ocular albinism. Amy's photosensitivity and sun-sensitive skin made the family's outdoor recreational activities very challenging. At the IFSP meeting, the family stated that they wanted Amy to have a love of the outdoors and confidence in safe movement on the hillside paths by their home. These priorities became a focus of the early intervention team via IFSP outcomes and strategies. Vic, the OMS, shared information about protective clothing and sunglasses. As a result, Amy initially became a part of the outdoor walks in a baby pack on her father's back. Later, outdoor activities were planned first with her adaptive mobility devices and then with her cane. One lesson included a short hillside walk culminating with a picnic. Vic was able to incorporate goals of early travel into outdoor activities that supported the family's priorities.*

### **The transdisciplinary team model**

Developmentally appropriate and family-centered practices are best supported by the transdisciplinary model of intervention (Hatton et al., 2003). A primary early interventionist, collaborating with other team members, provides direct support to the family. Detailed information about family-centered approaches and effective teams can be found in Sessions 1 and 2 of *Family-Centered Practices for Infants and Toddlers With Visual Impairments* (Hatton et al., 2003).

As required by Part C of IDEA (1997) and because O&M for infants and toddlers involves many developmental domains, the team should be comprised of individuals of various disciplines. The team for a child with a visual impairment typically includes the

family, a teacher of children with visual impairments, an orientation and mobility specialist, an early interventionist, and other therapists and diagnosticians (Hatton, 2004). Handout B, *Missions and Roles of Professionals From Different Disciplines*, describes the responsibilities of professionals on a transdisciplinary team.

Professionals from various disciplines might suggest similar intervention goals for the IFSP. Often, both the OMS and the TVI will address motor development, functional vision, language concepts, and cognitive skills, as well as other sensory awareness and environmental experiences. Many TVIs feel comfortable introducing young children and their families to early O&M goals such as sensory awareness, spatial concepts, body image, and basic protective and alignment techniques with consultation from an OMS. Direct evaluation for and introduction of protective devices such as adaptive mobility devices (formerly called precanes) are the responsibility of OMSs. Although many of the goals of OMSs will be similar to those of TVIs and other early interventionists, OMSs may differ in the strategies for attainment as well as the outcomes they recommend. OMSs may emphasize certain goals such as purposeful movement, use of sensory information for orientation, and acquisition of spatial relationships.

Occupational or physical therapists may recommend goals to facilitate motor development and movement that are compatible with the goals identified by OMSs. For example, the OMS might share information with the physical therapist regarding how blindness and low vision may affect early motor development. At the same time, the physical therapist may share expertise on strategies for facilitating trunk rotation, reciprocal movement, and movement in the opposite direction (most often in opposing limbs).

*Andrew is a 16-month-old child with retinopathy of prematurity who is blind. Andrew's parents are anxious for him to learn to walk. They are pleased that Pauline, a physical therapist, is part of their early intervention team. Pauline wanted to use a series of equilibrium exercises as a way to increase Andrew's low postural tone and strengthen his trunk muscles. One such activity involved using a therapy ball to work on balance reactions. She placed Andrew on the large therapy ball in a sitting position. Her intent was to move the ball back and forth slowly and in a manner that would cause Andrew to tighten his back and stomach muscles to help him maintain an upright posture. Unfortunately, Andrew was frightened by this activity and spent most of the time crying for his mother.*

*Cleo, the OMS, had a chance to observe the activity during a joint home visit. She realized that Andrew had no idea where he was in space other than on top of a moving ball with nothing to hang on to while his balance was challenged repeatedly. Cleo suggested that Pauline begin the activity by bringing the ball to Andrew while he was sitting on the floor. She could then work with him to stand up against the ball, using it as a tool to pull up on. Aware of Andrew's motivation for sound, Cleo suggested that Pauline play a series of pat-the-ball rhythms to motivate him to attend to the ball. Cleo*

*also suggested that Pauline slowly roll the ball forward while holding Andrew's hand over the ball so that his feet came off the floor with each short roll forward. Over time she began to roll him up onto the ball while holding onto his feet, then roll the ball forward so that his hands could reach out and touch the floor to secure a favorite toy.*

The overlap of goals that occurs among disciplines is beneficial to the child and family because it provides repetition and consistency, both of which are important for very young children. Ideally, the transdisciplinary model enables professionals from different disciplines to offer their own particular expertise and learn from one another while developing and implementing the family-centered IFSP. This concept is also termed role release (Hatton et al., 2003). Role release involves the sharing of expertise specific to the disciplines of other team members and the undertaking of new roles during the process of mastering discipline-specific skills. Handout C, *Techniques That Facilitate Role Release Within the Transdisciplinary Model*, describes ways to support role release within the transdisciplinary model.

*Maya is a fun-loving child with cortical visual impairment; she also has cerebral palsy. She and her family receive weekly home visits from their primary early interventionist, Humar, who is a teacher of children with visual impairments. He not only works closely with Maya's family but also works with the physical therapist, occupational therapist, orientation and mobility specialist, and nutritionist. These four specialists spend little individual time with Maya and her family. Instead, they make joint visits to the home with Humar to share information and resources.*

*On a joint home visit, the OMS might observe how Maya rarely reaches for objects. She shares her concern with the family and Humar. Collaboratively, they plan strategies to encourage Maya to reach for objects during daily routines. The family identifies routines that include goal-directed reaching. Humar suggests adding movement and the colors red and yellow to objects involved in the routines. The OMS models a strategy for goal-directed reaching that involves four steps: (a) explaining to Maya what is happening; (b) presenting a familiar object to view, touch, or hear; (c) waiting for her to demonstrate attention; and (d) providing assistance to reach, if necessary.*

In order to make the transdisciplinary team model as effective as possible, child-specific in-service training for team members as well as general workshops for parents and professionals in the community should be conducted regularly.

During infancy and childhood, experiences must occur daily or throughout the day for the child's generalization and retention of skills. Consequently, the OMS's role is often consultative. Although direct intervention is sometimes appropriate, family members, TVIs, primary interventionists, and therapists must provide frequent reinforcement to achieve O&M outcomes. Even when direct services are needed, the shortage of OMSs makes consultative services the only available option in many areas. In some instances

interventionists hold dual certification as orientation and mobility specialists and as teachers of children with visual impairments.

#### **D. Components of early orientation and mobility**

Orientation and mobility for very young children has been greatly modified from traditional techniques and methods and is far less reliant on the acquisition of highly technical skills. With the inclusion of children from birth through 5 years of age, the field of O&M continues to refine instructional philosophy and intervention techniques. A developmental approach to O&M has helped to shape the definitions and program components of O&M for infants, toddlers, and preschoolers.

As the field of O&M evolved, several authors expanded the service components for young children. In 1984, Hill et al. included the following components of O&M for preschool children:

- sensory skill development,
- concept development,
- motor development,
- environmental and community awareness,
- formal orientation (e.g., hand search or room familiarization techniques), and
- formal mobility skills (e.g., trailing, protective technique, cane use).

Environmental and community awareness and formal orientation were introduced as new skill components for children from 3 to 5 years. In 1987, Hill, Smith, Dodson-Burk, and Rosen added fine motor skills and gross motor skills to the list of intervention components in their Preschool O&M Project. In 1993, Anthony suggested purposeful and self-initiated movement to initiate the achievement of specific goals as another relevant skill for infants and toddlers. Table 1 describes the role of the OMS in four components of early O&M for infants and toddlers as identified by Anthony (1993) and Anthony et al. (2002). (Also see Handout D, *The Role of the OMS With Infants and Toddlers*.)

Another role of OMSs in providing developmental orientation and mobility intervention is to modify the traditional O&M curriculum to include

- sensory experiences and body awareness that will facilitate the development of discrimination skills and position in space;
- hands-on experiences that facilitate cognitive development including object concepts, play and exploration skills, and early environmental experiences;
- environmental awareness and exploration;
- establishment of social relationships that foster confidence to move and explore;
- facilitation of optimal independence in daily routines, including movement to and from storage and activity areas;

- use of routines to provide repetition, generalization, and functionality;
- developmentally appropriate modifications of standard techniques for protection, alignment, and systematic search; and
- postponement of selected techniques and experiences to assure developmental readiness and implementation within existing routines and settings.

<b>Goal Area</b>	<b>Role of OMS</b>
Orientation	To continually expand children’s concepts of their own bodies, daily settings, and locations within each environment.
Mobility	To encourage, then refine, independent movement (including the use of appropriate mobility tools such as adapted mobility devices or long canes).
Purposeful movement	To reinforce children’s reasons to move within different environments so that they are motivated to explore and can accomplish goals that require movement.
Environmental analysis to ensure safety and encourage movement	To assist families and other team members to analyze daily environments for safety factors and for adaptations that will maximize self-initiated and goal-oriented movement. Adapting children’s first learning environments such as the crib or first floor play space promotes their understanding of spatial relations and purposeful movement exploration.

**Table 1. The Role of the OMS With Infants and Toddlers**

The field of orientation and mobility is a relatively young profession. However, there has been considerable change during the past two decades to ensure that O&M services address individual needs regardless of age or presence of additional disabilities. For young children with visual impairments, orientation and mobility may be enhanced if it is introduced early while children are acquiring motor skills and building conceptual frameworks.

OMSs and TVIs who understand early childhood development and the impact of visual impairments upon development have much to offer children, families, and transdisciplinary teams. As the field continues to expand its work with infants and toddlers, practitioners will identify resources and specific strategies that will further advance the field of orientation and mobility.

**E. Roles of OMSs and TVIs in facilitating early orientation and mobility**

TVIs and OMSs who provide services to very young children with visual impairments recognize that early sensory, cognitive, and motor development form the foundation for orientation and mobility. They also recognize that early O&M assessment must include assessments of many related developmental domains.

Sensory development and organization is directly related to orientation and mobility. We learn through our senses. Most infants are born with the ability to see, hear, smell, taste, and respond to touch. One of the first tasks of infancy is to modulate and organize sensory information. Sensory information, in singular presentation or in combined forms, will ultimately be used to alert, calm, entice, reinforce, and inform the developing infant. Caregivers and early intervention professionals must work together to support the child's task of sensory organization. OMSs and TVIs have several key roles specific to sensory organization and development:

- to work with the family to ensure that proper medical evaluation of vision and hearing has occurred,
- to correctly interpret eye care and audiological reports,
- to learn about children's sensory abilities,
- to continually refine children's ability to respond to and use sensory information based on mindful presentation of sensory information in everyday environments (Anthony, 1993),
- to assist families and early intervention teams in implementing appropriate adaptations to optimize children's sensory-based learning, and
- to identify the types of sensory-based motivators that can be used to entice young children to move and explore space.

**Cognitive development** is related to early orientation and mobility development. According to Piaget, during the sensorimotor period (the first stage of cognitive development), there is continual interplay between children's evolving cognitive and motor skills. Exploration and cognitive development depend upon curiosity and the ability to move. To effectively facilitate cognitive development, OMSs and TVIs must:

- understand and explain to the family and the transdisciplinary team the significance of cognitive development, including body concepts, spatial relationships, positional concepts, object concepts, cause and effect, means-end, and imitation as they relate to motor and movement development and orientation and mobility;
- understand and explain to the family and the team the impact of blindness or visual impairment on early cognitive development and motor and movement development;
- collaborate with the family and transdisciplinary team to identify each child's cognitive abilities that might facilitate motor and purposeful movement development; and
- introduce strategies within daily routines that will facilitate cognitive development leading to purposeful and self-initiated movement in young children with VI.

**Motor development and movement** are critical components of O&M. As children acquire motor milestones and start to move, the need for input from OMSs becomes more evident. Often, delays in motor development and movement motivate referrals to OMSs. OMSs and TVIs have many important roles in promoting optimal motor

development and movement in infants and toddlers who are blind or visually impaired.

These roles include:

- explaining the impact of blindness and visual impairments on motor development and movement to all team members;
- suggesting specific strategies to the team that will promote security, safety, and purposeful, self-initiated movement in young children with visual impairments; and
- collaborating with physical and occupational therapists to ensure optimal motor, sensory, and movement development through functional activities within the context of daily routines and natural learning opportunities.

To facilitate optimal motor development, the expertise of occupational therapists, physical therapists, OMSs, and TVIs is required to ensure that interventions are appropriate for children with visual impairments. For children with multiple disabilities, occupational and physical therapists must be involved in intervention planning and implementation. Additionally, all team members should collaborate to design and maintain safe and secure environments for children, making certain that children know what is going to happen before they are touched or moved, and demonstrating or modeling skills that are usually learned visually. Handout E, *A Guide for Teachers and Therapists Working With My Child* (Brown, 2004), provides suggestions from the perspective of a parent on how to interact with children with visual impairments.

**Assessment.** Pogrund, Fazzi, and Schreier (1993) assert that every person who is blind or visually impaired has a right to instruction by an OMS based on assessment results. Infants and toddlers with visual impairments have unique assessment needs. OMSs are qualified to assess sensory, conceptual, and physical abilities that are related to orientation and mobility.

Two considerations in particular are important for O&M assessments and subsequent interventions with infants and toddlers who are visually impaired. First, Part C of IDEA (1997) requires that the family and other members of the early intervention team must collaborate for assessment of family concerns, resources, and priorities and for the completion of an assessment that involves at least two separate disciplines. Family priorities must be reflected in the goals and objectives of the IFSP. Because the early development of infants and toddlers cannot be separated into distinct disciplines, the expertise of multiple disciplines is necessary for appropriate assessment and intervention. Second, a developmental approach, based on knowledge about early childhood development and the appropriate interpretation and application of O&M concepts and skills for infants and toddlers, is required for accurate assessment and effective intervention. Ideally, an OMS with expertise and experience with infants and toddlers will be available to guide appropriate O&M assessment and intervention.

## **F. Attachment and mobility**

Attachment is the bond that children have with significant others. Infants are able to recognize faces visually even a few hours after birth (Johnson, 1999; Johnson, Dziurawiec, Ellis, & Morton, 1991). Innate reflexes facilitate interactions and attachment between caregivers and infants (Aitken & Trevarthen, 1997; Bigelow, 1995; Preisler, 1995, 1997). Researchers of both sighted and blind children have documented the primacy of vision in facilitating attachment, affective development, and prelinguistic communication (Fraiberg, 1977; Mundy & Willoughby, 1996; Preisler, 1991, 1995; Rogers & Puchalski, 1984; Rowland, 1984; Warren & Hatton, 2003).

During infancy, cognitive, motor, affective, communicative, and perceptual development are completely interwoven. Development in all of these domains is related to attachment. Secure attachment is believed to be related to the willingness of infants to venture out into the environment to explore and experience it. Exploration of the environment develops concepts, spatial awareness, and motor skills. Infants' earliest social-emotional responses serve not only to maintain proximity to other people for protection and survival, but also to facilitate development in all domains (Warren & Hatton, 2003).

Children with vision who first start moving out into the world will often move a few feet, then look back at their mothers to assure that they are nearby. This *social referencing* appears to provide children with the self-confidence to continue to move and explore. Children who are securely attached to their parents are more likely to explore. Therefore, severe visual impairment may impede exploration and movement by making attachment more challenging, possibly by decreasing motivation to move out into the world to explore it, and by making it impossible or difficult to glance back at the caregiver (i.e., use social referencing) during early exploration (Warren & Hatton, 2003).

The development of attachment largely depends on caregivers' ability to perceive and respond appropriately to infants (Fazzi & Klein, 2002; Warren & Hatton, 2003). *Contingent responsivity* is defined as "caregivers' behavior that is closely related to the infant's signals in time and function" (Chen, 1999, p. 33). The parent's presence and contingent responsivity must in turn be perceived by the infant (Warren & Hatton, 2003). Contingent responsivity includes reading the child's signals to know when the child wants to interact, when the child is tired or overstimulated, and what interests the child. For example, an infant who is blind may become very still when a parent begins talking to her. This could be "attentive stillness," in which the child is staying still to better attend to the parent's interaction. "Attentive stillness" is not a behavior frequently observed in children with typical sight, and parents have to learn how to recognize and respond to their children's subtle cues (Als, Tronick, & Brazelton, 1980). Contingent responsivity gives infants a sense of control over their environment, which facilitates development. Ferrell (1985) recommends several strategies caregivers can use to facilitate bonding with children.

- Talk to children before picking them up.
- Give children a few seconds to adjust to new situations (e.g., being picked up).
- Look for subtle responses, such as changes in breathing, or opening and closing hands.
- Allow babies to touch the faces, beards or moustaches, and hair of caregivers to learn to recognize them.
- Carry babies while working around the home or going out into the community.

*Sammy is 3 months old and was born with an undetermined retinal disorder that resulted in blindness. He lives at home with his parents and twin 2-year-old sisters. He receives weekly early intervention and service coordination at home from a teacher of children with visual impairments (TVI). His TVI and his mother asked for consultative visits from an OMS to identify strategies for involving him more in family activities. His mother described a hectic and stressful household due to the combined needs of twin toddlers and a newborn. Additionally, Sammy is often agitated and difficult to console, requiring frequent attention.*

*The OMS suggested the use of a front sling or pack that would allow Sammy's mother to carry him close to her body during daily household activities. With the gradual introduction of the sling, Sammy whined and fussed less often. It also allowed his mother to proceed with other tasks and gave the two of them special, intimate time together. His mother reported feeling more relaxed and content with him close to her. Because she could then attend to the twins more easily and more often, she began to feel less guilty about the time she devoted to Sammy. The OMS visited the family four times over the course of several weeks.*

*During these visits, and with the help of the TVI, additional suggestions were made to enhance Sammy's individual time with his mother, as well as related developmental issues. These included bath time at the kitchen sink involving washing and naming Sammy's major body parts, followed by an embellishment of a peek-a-boo game already shared between the two of them during towel drying. Sammy's mother was interested in learning infant massage from a certified instructor, and she was referred to a local occupational therapist who had this training. Meanwhile a simple informal method of firm touch was demonstrated, with emphasis on the use of a predictable routine and words and with opportunities for Sammy to initiate or withdraw from these activities.*

Without visual lures, infants who are severely visually impaired may have little interest in objects and the external world during their first 12 to 18 months (Bigelow, 1995; Preisler, 1995, 1997). Infants who may not be interested in the external world have little reason to reach out to objects in the environment or to move out to explore space and the world around them. For that reason, secure attachment is even more critical for infants who are visually impaired. Parents with securely attached infants will be more

likely to encourage their children to move out and explore the environment (Warren & Hatton, 2003).

Als et al. (1980) and Preisler (1991, 1995) documented positive adaptations in some mother-infant dyads that compensated for lack of vision. Als and colleagues described interactions in which the mother was highly responsive to an infant without vision and created “affective reciprocity” with the infant using a set of highly interactive behaviors that effectively engaged the infant and resulted in what would currently be described as *affect attunement*. Preisler (1991) used videotapes of parent-child interactions to assist parents in their efforts to read and respond to their children’s cues. Ideally, TVIs and OMSs recognize the importance of helping parents learn to read their infants’ cues and respond in ways that may not be instinctual (Warren & Hatton, 2003).

Infants with severe visual impairments are at a disadvantage because they lack access to the visual environment that prompts most children to move. In addition to affecting attachment to parents, the social referencing that occurs during early exploration motivates movement into and knowledge of the world. Tröster, Hecker, and Brambring (1994) suggested that, in sighted children, vision may reduce the anxiety associated with locomotion by allowing them to see parents’ encouraging facial expressions.

## **G. Promoting independence**

Without vision to monitor social responses to attempts to master challenging new tasks, young children who are blind may need additional time and strategies to establish strong trust in others. This is an important consideration in building confidence and a sense of security during movement. Vision offers protection by allowing children to monitor the behavior of people and environmental events from a distance. Without the ability to visually monitor the environment, children with visual impairments may exhibit wariness (Lowry & Hatton, 2002).

Fraiberg (1977) and Preisler (1991, 1995, 1997) noted that caregivers’ reactions to the disability can affect the experiences available to children. Infants who are blind are uniquely dependent on their caregivers as mediators of the environment because they are less able to acquire incidental information about the environment (Bigelow, 1995; Simmons & Davidson, 1992; Preisler, 1991, 1995, 1997).

Sighted infants readily acquire concepts of space, distance, and location/orientation as they begin to sit, crawl, pull to stand, and walk. While practicing these motor skills, they see interesting objects and people that elicit exploration through vision, mouthing, and touch. Therefore, as infants with vision acquire motor milestones, their world is enlarged, and motor development is facilitated. Families of infants who are blind must be diligent in motivating their children to move out into the world. They often must overcome their own fearfulness and tendency to be overprotective.

Opportunities and encouragement to crawl and walk are important factors in motor and movement development. Norris, Spaulding, and Brodie (1957) noted considerable individual differences in their sample of infants and found that those who were delayed in locomotion were “typically those who were not given appropriate opportunities” (p. 39). Similarly, Brambring (1996) found considerable variability in outcomes to be related to positive parental interactions and encouragement of activity. Providing infants with appropriate learning opportunities and encouragement to crawl and walk is an important factor in developing independent movement.

In homes, childcare settings, and preschools, *independence* is critical. The combination of blindness or severe vision loss, the young age of children, and lack of experience often results in protective and “serving” behaviors toward children with visual impairments. Protection and close supervision are legitimate and necessary in many instances, but not all. Often, it is up to the TVI or OMS to provide information, resources, and support to achieve the goal of competence and independence. It will be helpful for the OMS and TVI to encourage families and caregivers to perceive independence as a moment-to-moment, day-to-day strategy that not only perpetuates itself but fosters broader concepts of the world at large—children who are blind cannot learn without doing. Independence is not merely a nebulous goal in the far-distant future; it is a crucial strategy for learning from infancy.

*Jason was a 19-month-old who had retinopathy of prematurity with light perception in his best eye. Leah, the childcare provider, cared for him and his twin brother in their home each day while their parents went to work. Leah had been with the boys since their early infancy and was highly involved in intervention decisions and implementation. Both boys were very curious and eager to explore. Jason’s visual impairment, however, caused him to miss many incidental learning events during the daily routine. The OMS was concerned that Jason might miss important environmental concepts and be delayed in social and language development. In addition, the OMS was concerned because Leah always brought food and objects to Jason rather than allowing him to assist in securing them himself. As had happened with many other children on her caseload, the OMS feared that Jason would learn to expect objects to appear and events to happen without any effort on his part.*

*With examples and encouragement, Leah began involving Jason and his brother individually in simple common household tasks that hold special meaning for them. On alternate mornings at bottle time, one twin helped her with heating the water in the microwave oven, and the other helped find their prepared bottles on a lower shelf of the refrigerator.*

*During a recent visit, the OMS found Leah and Jason in the kitchen preparing bottles, with Jason seated comfortably on the counter near the microwave oven. He attended closely as Leah put in the two bottles, helped him shut the door and push a button, and gave brief, simple words for the objects and actions involved. She used a wonderfully*

*slow and patient pace with moments of quiet to allow Jason to process what was happening and invite self-initiation.*

### **Promoting independent movement and exploration**

Independence requires active involvement, at home, childcare centers, and preschools, in a wide range of activities, from structured group and individual activities to “incidental” preparation and clean-up. As children acquire cognitive and language skills, they should become involved in the entire sequence of events within particular routines. Children with vision have repeated opportunities to observe different parts of a snack sequence—getting napkins, cups, and cookies from the cabinet; setting the table; getting juice from the refrigerator and pouring it into cups; throwing trash in the garbage can; putting food away; wiping the table; and sweeping the floor. Children who are blind or visually impaired may miss all or large parts of this sequence unless they are engaged in hands-on experiences. As soon as children’s interest and postural and motor abilities allow, participation in segments of event sequences should be encouraged. Participation can be very simple and brief. Adults might merely place young infants close to the action and provide simple verbal descriptions, along with an associated object to hold. Older toddlers might be moved through brief components of the entire sequence. Specific methods for involving children in daily routines should be individualized and should consider the logistical needs of the setting, as well as the family’s concerns, resources, and priorities.

*Clara’s grandmother takes care of her and her three siblings during the day while her mother goes to school and work. Her grandmother spends a great deal of time every day in her kitchen cooking and cleaning for the busy family. The grandmother has very little time to devote to teaching Clara to be more independent.*

*When Clara was 30 months old, Grandma was doing most things for her granddaughter, and Clara had very little awareness of objects and events in her immediate environment. Her grandmother was interested in encouraging greater participation in Clara’s personal routines, especially in anticipation of a new preschool setting in the fall. She and the OMS discussed showing Clara how to find her shoes, jacket, and other personal items during her daily routine. However, they observed mixed success because of the number of additional “helpers” in the home—siblings and other relatives who wanted to do as much for Clara as possible.*

*The TVI helped by providing ongoing encouragement to Clara’s siblings to keep her things in predictable places and gave special “assignments” to each child that involved helping Clara play with selected toys and find personal items by herself. With further discussion, it became clear that, because Clara’s grandmother spent so much of her time in the kitchen, she would provide hands-on experiences for Clara there.*

*Grandma decided to move a child-sized table and chair set from the bedroom to a corner of the kitchen. She and the OMS agreed upon a routine that allowed Clara to get*

*her own spoon and bowl from a specially designated, accessible drawer and take it to her nearby table for lunchtime with one of her siblings. The drawer was chosen for its proximity to the table. After lunch, Clara would take her bowl and spoon to the sink and throw her napkin in the trashcan. Initially, Clara required considerable verbal and physical assistance, as well as auditory and visual cues to complete the routine. Soon, however, only verbal reminders were required, while her grandmother continued with her kitchen duties. Pleased with her success, Grandma vowed to gradually expand Clara's involvement with kitchen tasks during the upcoming months.*

Lowry (2004c) identified several strategies that may help children comprehend daily routines and activities, as well as promote more confident and efficient movement. These strategies are designed for both home and center settings. The list of strategies is also provided in Handout F, *Strategies That Facilitate Independent Movement in Daily Routines*.

- **Hands-on involvement.** Encourage direct hands-on involvement with all materials, objects, equipment, visual displays, pictures, and books during group and individual structured activities, such as morning circle or during dressing, eating, and household chores at home.
- **Helping.** Allow the child to assist with small or larger actions within preparation and clean-up sequences for activities such as lunch, toy play, story time, or arts and crafts. Include this approach during self-care times such as diaper change, toileting, or hand washing. For example, let children locate the soap and throw used paper towels in the trash independently.
- **Reaching.** During playtime, encourage children to reach for nearby toys and provide sound clues if needed, instead of giving objects directly to children. If necessary, make this easier for the child by discreetly moving it closer; this may provide more immediate success and promote subsequent efforts on the part of the child.
- **Orientation.** Through mediated play, gradually familiarize children with small areas of the room by identifying prominent landmarks, furniture, and interesting toys. Help children move to the play area where favorite toys or objects are stored as independently as possible instead of taking objects and toys to them.
- **Play space.** Set up one or more play spaces that include toys, objects, and sensory materials that are favorites and keep them in predictable locations. Families and caregivers should assume primary responsibility for replacing these items two or three times a day so that children with visual impairments can find them again. Older toddlers can learn to help put these objects away. Use a mat or throw rug of a distinct texture to mark the area.
- **Room arrangement.** Arrange furniture, equipment, and toys in predictable and stable locations, especially when the child is introduced to a room, and when independent walking is emerging or newly acquired. Later, small alterations in room arrangement may not confuse the child or interfere with orientation. When furniture rearrangement is necessary, involve the child in the rearranging if possible, or show

the child the changes as soon as possible. Evaluate the room for hazards and remove them or relocate minor ones to areas of the room where there is little movement or traffic. Provide supervision, verbal reminders, and encouragement to use appropriate protective methods when children are moving about the room.

- **Exploration and play.** Provide adult-mediated play during which the child makes choices and is allowed to play independently, with the adult adding verbal descriptions and occasional demonstrations of expanded actions. Mediated play will expand the child's repertoire of play, social, and cognitive abilities and will provide opportunities for purposeful movement to a particular destination. For example, the child may not choose to locate the block center if building with blocks is not familiar and meaningful to the child. Frequent opportunities for broad exploration, free-choice play, and floor time without adult interference are equally important. Avoid overstructuring the child's day.
- **Miniroutes.** Use very short miniroutes to move to motivating daily events, such as meal times, bath time, and "morning circle," until independent travel to these destinations begins to occur spontaneously. Early miniroutes are often most successful if the child uses a trailing surface to the destination landmark, rather than stepping across open space. Previous cruising experiences provide a foundation for the use of trailing or cruising during miniroutes. Initially, this approach relies on very short distances dictated by the child's motor and postural readiness. Children who are not taking steps independently can still participate in short miniroutes. For example, one might position a child adjacent to his highchair at snack time and encourage him to reach toward the highchair.

## **H. Facilitating ease of movement**

For the development of concepts and cognitive skills, it is important that children be permitted to move and explore freely. Children with visual impairments may need more structure and adult mediation to acquire many crucial concepts and skills, but they also need time to experiment with and apply what they are learning. While opportunities for unrestricted movement and play are crucial to development, they present greater challenges when children are not able to visually monitor obstacles and other hazards. Responsible supervision is a primary concern for infants and toddlers with visual impairments. Fortunately, many toddlers with visual impairments naturally move more cautiously in response to reduced visual information, but this is not the case with all children.

Supervision and standard precautions will continue to be important throughout the preschool years. However, protective measures should not interfere with children's ability to move and explore as freely as possible. Adequate supervision that is respectful of the child may involve standing silently nearby to catch a possible misstep, while allowing independent movement. Handholding and more formal guide techniques are often unnecessary in familiar, predictably arranged areas. Verbal cues and brief

physical prompts can often appropriately replace total physical assistance. Many children will become familiar with their homes and classrooms and learn to avoid most obstacles kept in predictable places. Toddlers, however, do not have steady balance and agility. Furthermore, toddlers' ability to maintain attention to tasks is variable at best. Supervision is important for even the most competent toddlers. Even close supervision will not prevent all accidents; falls and stumbles are inevitable and are a part of motor learning for all children.

Simple precautions should be taken to offer a safer environment, provide ease of movement, and reduce stress. Ideally, children with visual impairments should be able to experience the same freedom and ease of movement as children with normal vision. Lowry (2004d) suggests the following strategies for enhancing safety in homes, childcare settings, and preschools. (See Handout G, *Ways to Facilitate Ease of Movement*.)

- Provide appropriate supervision at all times while respecting the child's independence.
- Keep furniture, equipment, and other landmarks in predictable positions. Rearrange infrequently; if possible, rearrange only one small area or piece at a time. Involve the child in rearranging or provide hands-on demonstration of what has changed.
- Use simple verbal cues to alert the child to the presence of an upcoming obstacle. Tell the child what is in front and what to do about it, for example by saying, "The recliner is in front of you. Hands out." Physical demonstration of the hands-out position may be necessary. Avoid using vague expressions such as "Watch out" or "Be careful" that provide little useable information and may communicate fear.
- As much as possible, keep travel paths clear of shoes, toys, and other small objects, especially when walking is emerging or newly acquired.
- Reposition or remove low-lying obstacles such as cots, children's chairs, etc., so that they are away from travel paths.
- Reposition or remove head-high obstacles such as protruding wall shelves, fire extinguishers, wall-mounted pencil sharpeners, crank windows that open to the inside, and adult-sized tables so that they are away from travel paths. (Consult with the OMS for setting-specific solutions to dining tables in the home.)
- According to families' needs, temporarily add foam padding to the sharp edges and corners of coffee tables, hearths, etc.
- When outdoors, offer extra supervision and physical guiding when necessary around steps, curbs, sidewalk edges, ramps, holes, roots, diagonal guide wires, diagonal supports of swing sets and other equipment, head-high undersides of climbers and slides, unprotected elevated edges of climber platforms, and other low-lying and head-high hazards.
- Guide the child by the hand when moving past unsafe areas when needed. Ask the TVI or OMS to demonstrate an appropriately modified guide technique that involves

having the child hold on to the adult, rather than the reverse. At times, holding the child's hand will be necessary for compliance and expediency.

Many children can benefit from a setting-specific safety consultation by an OMS. This may be especially helpful in new settings.

## **I. O&M techniques for infants and toddlers**

### **O&M techniques**

Significant modifications of traditional O&M techniques can be introduced to many children within the first 3 years. Before O&M techniques are introduced, there are critical developmental skills that provide the foundation for later protection, alignment, and search methods. Early reaching for toys prepares children to reach out for obstacles later. Pursuit of a dropped toy can progress to two-handed extensive search for an object on a table. Two-handed cruising along furniture, walls, and cabinets is the foundation for one-handed trailing to locate a seat at snack time during the preschool years.

**Hand search** skills represent goal-directed reaching at its best. In infancy, encouragement and opportunities to reach for toys from all postures helps prepare children for more extensive searching later. Postural readiness will dictate how the infant is able to search. Children who are not able to sit independently and stably may demonstrate the most efficient reaching and searching in prone (i.e., on the stomach) or in the side-lying position. Stable sitting posture allows children to conduct broad hand searches of a tray with either hand on a highchair or adaptive seat. Children who can crawl, transition, and walk well have access to multiple planes for hand search (e.g., floor, tables, sofa, walls). Toddlers who can modulate movement from standing to midsquat to squatting and return may be ready to search multiple vertical shelves. Caregivers, TVIs, and OMSs should encourage one- and two-handed search skills throughout infancy and toddler years, but the child's postural abilities should always be taken into consideration. It may be helpful to consult with the child's occupational or physical therapist regarding positioning and search strategies. Handout H, *Hand Searching in Infants and Toddlers: Suggestions for Parents and Caregivers* (Sapp, 2004c), describes 12 ways to facilitate hand searching in infants and toddlers.

**Trailing** is a critical life skill that probably evolves from *cruising*, or walking along furniture or walls using two hands against the surface for support. Trailing involves lightly following walls or furniture to move from one point to another. This skill will be important throughout adulthood as a means of (a) verifying orientation by the recognition of a known landmark; (b) moving efficiently a short distance from one point to another; and (c) locating a specific landmark, object, or access. Children with visual impairments do not necessarily acquire efficiency and effectiveness in their hand use without appropriate intervention. Reaching, hand search, exploration, and manipulation

of objects and surfaces should be encouraged as early as possible. Between the phases of pulling to stand and walking independently, encouragement and incentives to cruise along furniture and a variety of vertical surfaces should be provided (Lowry & Hatton, 2002). During the “toddling” stage of early walking, children can be encouraged to walk near walls or cabinets and to put out one or two hands for occasional support and tactile confirmation of orientation. Even as more stable walking develops, brief intermittent contact with a nearby surface provides valuable information to toddlers with visual impairments and prepares them for more systematic trailing later.

Very simple trailing techniques can be utilized for toddlers who are still maturing and developing postural and motor skills. Handout I, *Hand Trailing for Toddlers* (Sapp, 2004d), describes methods for facilitating hand trailing with toddlers. Frequent intermittent contact is acceptable, especially with children who have difficulty processing considerable sensory input in a short span of time. More mature toddlers can sometimes tolerate continual contact for short distances of 3 to 5 feet. Hand position should be highly negotiable during these early years. If continual contact with surfaces such as walls can be achieved at all, the hands are likely to be held up near the shoulders and close to the body rather than placed in front of the body as in the traditional technique. At home and in childcare settings, toddlers can be reminded to trail briefly in appropriate situations (e.g., when walking down the hall in search of the bedroom door, to find a specially marked cabinet in the kitchen, to find an assigned seat at the snack table, to move from one center to an adjacent one). Directive words and phrases should be simple and easily understood, such as “Hand on the wall” or “Trail with your hand.”

**Upper body protection** is used to avoid injury above the waist while walking (Anthony et al., 2002). It is especially helpful for use in less familiar areas and with children who have just started walking. However, several factors seem to work together to make spontaneous use of this technique challenging for toddlers: (a) insufficient strength in the trunk and shoulder girdle, (b) absence of a specific spatial orientation that would allow awareness of an upcoming obstacle, and (c) developmentally appropriate distractibility and inattention. Supervision by a responsible adult is the first line of defense, accompanied by simple verbal reminders and frequent physical demonstration. Verbal reminders can be simple and to the point, such as “Hands out” said just before the child reaches the obstacle. Toddlers typically cannot perform the traditional one-armed cross-body technique due to the postural limitations mentioned. A method involving two hands extended forward is acceptable; extension of the arms at the waist or chest level may be the best the child can do. With maturity and practice, physical demonstration often becomes less necessary, but verbal reminders may be required well into the older preschool years.

Activities that strengthen the shoulder girdle and upper extremities may improve the child’s ability to reach out further when using upper body protection. These activities include pushing doors, chairs, large weighted boxes, and other heavy toys and

equipment. Consult with the child's occupational or physical therapist for additional ideas about strengthening the upper body throughout daily routines and activities. Upper body strength will be important for future fine motor, emergent literacy, and braille skills. The traditional lower-body protective technique may not need to be introduced until the preschool years or later due to the height of the average toddler. At this height most furniture and equipment present hazards at levels near the head or below the knee, creating little demand for the use of a lower-body method. Handout J, *Upper Body Protection for Toddlers* (Sapp, 2004e), describes general guidelines in facilitating upper body protection for toddlers.

**Guide technique** (also known as *human guide* or *sighted guide*) is a method of physically guiding the child when walking together, while providing the child with a greater sense of responsibility and control (Anthony et al., 2002). Guide technique can be introduced as soon as stable walking, a cooperative grasp, and overall compliance are established. Guide technique is a modification of the traditional technique used with older children and adults that involves the individual's grasping the guide's arm above the elbow. A successful modification for toddlers involves encouraging the child to grasp the guide's one or two extended fingers (Fazzi, 1995). This provides a reasonable shape and size for a small hand to hold and allows the guide to quickly grasp the child's hand if necessary. Ideally, the child should walk a half step behind the guide, stop promptly when the guide stops, and wait for the guide to step first at any curb or step. At this age, however, body awareness, spatial relationships, postural abilities, and attention often make it difficult to achieve many of these refinements. Achievable goals may be limited to maintaining grasp and waiting for the guide to step first. It will be helpful for all adults to use similar methods with the child. Admittedly, at this age it is often appropriate and necessary to hold the child's hand for safety, expedience, and compliance. At other times, however, guide technique will be beneficial. Generally, guide technique should be used in less familiar areas when needing to travel quickly; it should be minimally necessary in homes or childcare settings. Handout K, *Guide Technique for Toddlers* (Sapp, 2004b), describes ways to teach guide technique to toddlers.

## **J. Mobility devices**

Mobility devices such as certain toys and objects, pushcarts, adaptive mobility devices (AMDs), and long canes can be important components of O&M for toddlers with visual impairments. The following suggestions are intended as general guidelines that have been found to be effective with some children. OMSs must use their knowledge and experience, as well as the input of family members, to determine whether and how to introduce mobility devices to individual children. There are countless ways to teach mobility-device techniques to toddlers. In order to meet the unique needs of the children and families with whom they work, OMSs will have to modify the techniques suggested below, as well as create new ones.

**Toys and objects** can be used at the early stages of mobility to provide some levels of protection and orientation such as long handled spoon, beach balls, Hula Hoop, stick, etc. (Anthony et al., 2002). It is important to consider the safety, functionality, and social appropriateness of the objects.

**Pushcarts** and other commercially available push toys may help to develop concepts that will transfer to long cane use later (Anthony et al., 2002; Clarke, 1988; Lowry & Hatton, 2002; Skellenger & Hill, 1991). These concepts include the use of a tool to gather information about the environment, the use of an intermediate object to protect, and knowledge of how to maneuver around obstacles. Although pushcarts are often helpful in teaching these concepts, they do not immediately offer reliable protection for the child. Along with many of the techniques discussed so far, pushcarts offer protection only to the extent that the child understands the information they provide and knows how to maneuver accordingly. Most toddlers need varying degrees of assistance with both; therefore, pushcarts should be considered *training tools* rather than protective devices. Close supervision is important.

Pushcart toys may be more easily introduced to toddlers with visual impairments during incidental play. Familiar settings offer good opportunities for pushcarts during general exploration. Adult mediation of child-directed play with the device will be important. Adults should use simple words to describe what the cart touches and where the object is (e.g., in front, beside). Encouragement to explore the obstacles encountered will reinforce environmental concepts, the development of a “mental map” of the area, and tactile awareness. To correctly maneuver around obstacles, children may need accurate physical demonstration and verbal cues to turn and reverse pushcarts.

Well-made, substantial, and easily maneuvered grocery carts may be preferable. These easily carry the added weight (therapy weights, a bag of flour, a dictionary, a large plastic jar of peanut butter) that is helpful in increasing stability. It is important to consult with the child’s physical therapist to determine the appropriate push toy and weight, especially if the child’s posture and walking are not stable and refined. A push toy or cart in the hands of an unstable child is potentially hazardous to the child and others (Anthony et al., 2002.)

There is some controversy concerning the use of toy pushcarts as mobility devices with young children with visual impairments. While some practitioners use them as a method of promoting the emergence of walking, others feel that the appropriate use of pushcarts should begin after the child is walking with good stability (Lowry & Hatton, 2002). Children who are not yet walking independently may not be posturally ready to do so and need additional motor intervention, physical therapy, and time. Pushcarts, if introduced too early, may be misused to serve as support devices. Through consultation with appropriate team members such as physical and occupational therapists and OMSs, the team should ensure that children have acquired the postural readiness for

walking before push toys are introduced. In some cases, especially among children with additional neurological issues, a prescribed orthopedic support walker will be more appropriate. With other children, an emphasis on designing an inviting, safe, predictable, and manageable setting for beginning walking may be the most effective and enjoyable method.

**Adaptive mobility devices**, or *AMDs*, are special modifications designed to meet the needs of individuals who cannot easily use the traditional long cane (Anthony et al., 2002; Foy, Kirchner, & Waple, 1991; Lowry & Hatton, 2002). (The term *long cane* refers to the red-and-white cane used by many school-aged children and by adults.) Basic AMDs are made of PVC pipe and are boxlike or rectangular in shape, with wheels or rollers at the bottom that are in constant contact with the floor. The box or rectangle should be wide enough at the base that it fully prevents the child's body from colliding with obstacles in front of it (Farmer & Smith, 1997). AMDs can be customized to fit the needs of individual children; variations in design include small extensions at the bottom, padding across the handle bar, handle extensions at the top edge, and so on.

Lowry (2004a) identifies potential advantages and disadvantages of adaptive mobility devices and long canes (Clarke, 1988; Clarke, Sainato & Ward, 1994; Pogrud & Rosen, 1989; Skellenger & Hill, 1991). (See Handout L, *Potential Advantages and Disadvantages of Adaptive Mobility Devices Versus Long Canes*.)

#### **Adaptive mobility devices (AMDs)—advantages**

- Can be used with two hands, offering protection with minimal cooperation and effort
- Are easy to use and can often be introduced to younger children when well designed
- Offer an immediate sense of protection and freedom to some children
- Offer a greater arc of protection than long canes

#### **Adaptive mobility devices (AMDs)—disadvantages**

- Are not very compatible with trailing when using two hands
- Are awkward when used in crowded or narrow spaces
- Are unsafe for use in descending or ascending steps
- Can be difficult to use over many outdoor surfaces
- Can be difficult to store
- Can be a barrier to environmental exploration

#### **Long canes—advantages**

- Allow one hand to trail, locate objectives, place hand on railing, and confirm orientation
- Are easier to use safely on steps
- Are easy to store (e.g., can be folded and worn in a holster while eating, playing)
- Provide early experience with the actual device that will be introduced later

### **Long canes—disadvantages**

- Require more mature attention and motor skills to keep the device in front
- Leave broad areas of the body unprotected
- Do not initially achieve consistent arc coverage
- Are more challenging to introduce to younger and orthopedically involved children

Practitioners differ in their approaches and philosophies regarding the introduction of mobility devices. Also, the heterogeneity of young children with visual impairments suggests that many individuals will need different sequences, devices, and methods. Some practitioners prefer the introduction of the long cane early as the first and only formal mobility device (Pogrud & Rosen, 1989). Others believe that using a sequence of mobility devices ranging from pushcarts to adaptive mobility devices to long canes is of more relevance to young learners (Clarke, 1988; Clarke et al., 1994; Skellenger & Hill, 1991). Some OMSs believe that all mobility devices hinder children's learning because they limit direct contact with the environment.

At some point, the introduction of a long cane or one of its modifications may be appropriate. Some OMSs working with toddlers and preschoolers find children more receptive to long cane introduction at age 3 or later, and tend to use AMDs prior to that time. Occasionally, however, the long cane can be successfully introduced to younger children with potential who enjoy frequent trips outside the home and who have caregivers who would like for their children to have canes.

The introduction of long canes and AMDs should be made under the guidance of an OMS with considerable knowledge of the child, setting, and daily requirements (Anthony, 1993). These devices are prescriptive, i.e., the child and setting need to be evaluated for appropriateness of introduction, and the type and size of the device recommended. The OMS, TVI, parents, and other team members may need to consider several factors when determining when to introduce a mobility device. Lowry (2004b) recommends asking the following questions in determining if a mobility device is needed. (See Handout M, *Determining When a Mobility Device Is Appropriate*.)

- Does the child walk with good stability and are hands held at waist level or lower?
- Does the child show interest in the device?
- Is the family supportive and accepting of the device?
- Does the child understand cause and effect?
- Can the child maintain grasp of the device without assistance for a significant period of time?
- Does the child's ability to detect obstacles and drop-offs visually indicate the need for a mobility device?
- Does the child spend time regularly in a setting appropriate for use of a device, i.e., settings other than the home—school building, mall, department store, supermarket, church building, etc?

Using the evaluative information provided by the OMS, the team should discuss the introduction of the mobility device, with special consideration given to the parent, caregiver, or teacher who will be providing the most frequent assistance. Under ideal circumstances, the following sequence may be the most effective:

1. The OMS provides direct instruction for several sessions.
2. After consultation with the OMS, the TVI begins regular sessions with the device.
3. After consultation, the caregiver, primary early interventionist, or early childhood educator includes daily (or multiple times weekly) use within routines.

Adjustments to this sequence are likely because many situations do not offer ideal amounts of one-on-one time with the child.

The following information about strategies for introducing and teaching toddlers to use adaptive mobility devices and canes was written by Wendy Sapp (2004a). The material is also available as Handout N, *Adaptive Mobility Devices and Canes for Toddlers: Suggestions for O&M Specialists*.

### **Introducing the AMD or long cane**

When introducing an AMD or long cane to a child, plan on giving the child plenty of time to explore with device. Sit down with the child and tell her you brought a new device to help her when she walks. Tell her the name of the device (e.g., cane, AMD) and say that you are going to let her hold it. Tell her that she will get to walk with it in a little while, but first you are going to look at it while sitting down. Remind the child that she cannot swing the AMD or cane, because she might hit some one. Hand the child the AMD or cane and give the child plenty of time to explore it. The child may choose to feel it, look at it, smell it, or even taste it. As the child is exploring the device, name the different parts. You may want to describe how the parts feel and what color they are. Some children may want to name their device just as they name stuffed animals. Allow plenty of time for the child to explore the device and ask questions about it.

### **Adaptive mobility devices**

**First lessons.** Some children respond well to an initial period of AMD use during unstructured, but mediated, exploration of a large, open area. A spacious area with occasional interesting landmarks to encounter can provide a sense of freedom of movement and safety to the child, while prompting increased pace with minimal frustration. Large areas that might be appropriate for exploration include the halls of a building, gym, large department store, or a mall. When the floor surfaces are smooth and carpet free, the AMD will slide more easily, and the child will experience more success. The child will walk freely, while an adult mediates objects contacted by helping the child determine what the object is and how to maneuver around it.

Some children will benefit from more direct instruction in using the AMD. After the child has become familiar with the AMD, tell the child that you and he are going to walk with

the AMD. Ask the child to stand up and position the AMD in front of the child. Tell the child to reach out and hold on to the AMD with two hands. Let her practice holding on to the device and letting go several times. Some AMDs will stand unsupported but many will fall to the ground when not held. This experience gives the child a chance to learn more about the characteristics of her AMD. Then suggest that you take a short walk (3-5 feet) to find a large object that is important to the child (e.g., the couch where Mama is sitting, the toy box). Be sure the path to the desired goal is clear of obstacles and drop-offs. As the child walks, you may need to provide verbal or physical reminders to keep both hands on the AMD. When the AMD contacts the object, praise the child, "You made it to your toy box!" Some children will be fascinated by the AMD and will want to continue exploring. Other children will want to put the AMD down and spend time in the location they worked so hard to reach.

Most children will need several simple lessons like the one described above to begin using the AMD. These lessons should involve a motivating goal to reach and a short clear path to the goal. Some lessons may only last a few minutes due to the child's short attention span.

**Advanced lessons.** Once the child is able to use an AMD to travel a cleared path, you can begin teaching the child more advanced skills such as obstacle detection, drop-off detection, and trailing. Most toddlers can learn to detect obstacles with their AMDs. Drop-off detection and trailing are much more complex skills and will be too difficult for many 2-year-olds. For toddlers who are ready to begin drop-off detection and trailing, remember that they will most likely demonstrate beginning skills only; do not expect mastery of these skills.

*Obstacle detection* can easily be taught in a naturalistic way. Place an object in the child's path that will sound or feel very different from the destination when hit by the AMD. For example, use a metal trashcan as an obstacle when the child is trying to reach an upholstered chair. When the AMD contacts the obstacle, say "Oh, my! There is a \_\_\_ in the way. Let's go around it." Some children will want to stop and explore what the AMD hit. This is perfectly acceptable and a wonderful opportunity for learning. Other children may need some physical or verbal guidance to go around the obstacle. Several structured lessons on obstacle detection using large, distinct obstacles can help a child learn to recognize and maneuver around obstacles. In most households and childcare settings, children will have plenty of naturally occurring opportunities to practice obstacle detection.

*Drop-off detection* is possible with some AMDs but not with all. The commonly used AMDs are NOT designed to be used when ascending or descending stairways. An example of a naturally occurring drop-off that would be appropriate for a child to find with an AMD would be a story area at the public library that is two or three steps lower than the rest of the floor, or one step that leads from the porch to the walkway at a child's home. If the AMD is appropriate for detecting drop-offs, the OMS can plan

lessons to teach the child about them. Start with the child several feet from the drop-off. Tell the child that she is going to use her AMD to find a drop-off. You may need to use the language the child already knows for drop-offs, such as *stair* or *curb*, or you may use this as an opportunity to teach *drop-off* as a new vocabulary word. Reassure the child that you will not let her fall. Explain that you and the child will walk toward the drop-off and that, when you get close, the AMD will “drop” in her hand. Walk with the child toward the drop-off and tell her just before the AMD reaches the drop-off. When the AMD “drops,” say “Wow! Did you feel that? The AMD dropped.” Let the child practice walking up to the drop-off several times until she is comfortable with the way the AMD feels at a drop-off. To understand what the drop-off is, the child may want to step down the drop-off while holding your hand or a railing. Children should also have opportunities to practice finding drop-offs in lots of different locations with different types of flooring. Tell the child to be careful around drop-offs. Remind adults that they should always be within arm’s reach of the child when she is near a drop-off.

*Trailing* with an AMD refers to keeping the AMD in contact with a wall while walking. Trailing allows the child to know her location in space and maintain a straight line of travel. Trailing will not be appropriate with all AMD devices. Trailing is best taught using a miniroute to a meaningful location. Prior to the lesson, be sure the miniroute is clear of obstacles. Tell the child that you are going to walk with the AMD to the motivating destination—for instance, a bookshelf. Ask the child to stand next to the wall and hold the AMD so the side is touching the wall. You may need to help the child position her body and the device appropriately. Tell the child you want the AMD to keep touching the wall as you walk to \_\_\_\_\_. Walk with the child to the destination using verbal and physical prompts to keep the AMD against the wall as necessary. If the child knows how to trail with her hand, explain that she is now trailing with the AMD. Help the parents and childcare providers to identify short routes at home and in the childcare setting in which trailing would be appropriate. Encourage parents and childcare providers to keep miniroutes clear of obstacles and to have the child trail with the AMD during the daily routines.

**Use with parents.** Involve parents in lessons with the AMD as much as possible, to allow them to see the benefits of the AMD for their child. Once the child can walk with the AMD, the child should have daily opportunities to practice in appropriate environments. The child should use the AMD only in environments that are safe for the child’s current level of skill and should always be supervised by an adult. Ask parents to think of times each day when the child can use the AMD and encourage them to let the child use the AMD as often as possible. If parents are resistant to using the AMD, ask them to identify only one time each week when the child can use the device. As the child becomes more proficient and the parents become more comfortable with the device, encourage them to use the AMD more frequently. Because children are often very comfortable moving in their own homes, assist parents in thinking of other places to use the AMD such as on the walkway from the home to the driveway, in the grocery store, etc.

### **Long cane**

**First lessons.** Once the child is familiar with the cane, tell the child she is going to learn how to hold the cane. Ask the child to stand up, and tell her you are going to hand her the cane in a moment. Remind the child to hold the cane still, with the tip touching the ground. There are many ways to describe how to hold the cane, including “shaking hands with the cane,” using hand-under-hand modeling, and allowing the child to grip the cane as she wants and then use hand-over-hand modeling to adjust the child’s grip. Once the child has the proper grip, tell the child that you are going to position the cane. Move the cane into a modified diagonal technique. Now that the child is holding the cane, suggest walking to a nearby location (3-5 feet away with no obstacles in the path). Just before the cane contacts the destination (e.g., wall, chair, toy box), tell the child that the cane is about to contact the object. When the cane touches the object, praise the child for using the cane to find the object.

Most children will need several lessons to practice walking short, clear paths with their canes. For the best success, start with lessons on hard floorings such as linoleum and use a mushroom or ball tip. Hard floor surfaces and mushroom or ball tips will help the cane slide more easily than on carpeting or when using a pencil tip. During this practice, stress two issues with the child and parent: (1) keeping the cane in front of the child and (2) keeping the cane tip on the ground. Do not worry about proper grip or keeping the cane in the diagonal position until the child is able to consistently keep the cane in front of his body with the tip on the ground. Most toddlers will need reminders to keep the cane in front of their bodies, so be prepared to provide lots of verbal prompts. If children experience excessive difficulty keeping the cane in front of their body, consider adding an L-bar as described in *Standing on My Own Two Feet* (LaPrelle, 1996). Many children who have difficulty keeping the cane in front lack spatial and cognitive concepts and would benefit from further concept development. Concept development could co-occur with cane instruction, or cane instruction could be postponed until the child develops more spatial and cognitive skills.

Some children will like to experiment with moving the cane as soon as they begin using it. Show the child a modified constant contact technique in which he keeps the tip on the ground and slides the cane from side to side. Provide opportunities for the child to practice moving the cane gently and in an appropriate arc width while standing still. You can stand in front of the child with your feet spread apart and have the child gently move the cane between your feet. Instead of your feet, you could also use the legs of a child’s chair as an arc-width guide. Even if you want the child to use a diagonal technique rather than constant contact, this practice will allow the child to feel the range of positions in which the cane is still in front of his body and will teach the child to move the cane gently.

**Advanced lessons.** The long cane can be used to help a child travel in almost any environment. As toddlers, children will require close supervision when using their cane and will not use the cane in all environments. Many children can begin learning more

advanced cane technique at very early ages even though they will not fully master these skills until preschool or elementary school age.

*Obstacle detection* refers to using the cane to locate obstacles in a path. Obstacle detection is easily taught by placing a large obstacle in the child's path. When the cane contacts the obstacle, tell the child what happened. If the child wants to explore the object with her cane or her hands, allow her to do so, but do not allow her to perseverate on the object. If the child was walking toward a specific destination, do not let her explore the obstacle so long that she forgets her travel goal. Encourage children to move around obstacles to reach their destinations. Some children need help learning how to get around objects and continue on their path. As children learn to detect large obstacles, begin presenting them with smaller obstacles. In most homes and childcare centers, children will have numerous natural opportunities to practice detecting obstacles.

*Drop-off detection* can safely be accomplished by a cane user given adequate instruction. Drop-off detection should not be attempted unless the child is able to consistently keep the cane tip on the ground at least one step in front of her body. Start with the child several feet from the drop-off. Tell the child that he is going to use his cane to find a drop-off. You may need to use the language the child already knows for drop-offs, such as *step* or *curb*, or you may use this as an opportunity to teach *drop-off* as a new word. Reassure the child that you will not let him fall. Explain that you and the child will walk toward the drop-off and that, when you get close, the cane tip will drop. Walk with the child toward the drop-off and tell him just before the cane tip reaches the drop-off. When the cane drops, say, "Did you feel that? Your cane dropped." Let the child practice walking up to the drop-off several times until he is comfortable with the way the cane feels at a drop-off. To understand what the drop-off is, the child may want to step down the drop-off while holding your hand or a railing. Children should also have opportunities to practice finding drop-offs in lots of different locations with different types of flooring. Tell the child to be careful around drop-offs. Remind adults to stay within arm's reach of children who are near drop-offs.

A few 2-year-olds will be able to use their canes to safely ascend and descend single steps (e.g., a curb) or stairways with adult supervision. For these children, you will teach the traditional formal techniques for ascending and descending stairs. The main modification will be to simplify your language and provide verbal and physical assistance as needed.

*Trailing* with the long cane is an excellent way for a child to remain oriented while traveling and to maintain a straight line of travel. Generally speaking, children will need to be able to maintain a modified diagonal technique in order to trail, but some children who have difficulty maintaining the diagonal technique may use the trailing wall as a cue to keep their canes in a modified diagonal position. Cane trailing is often most

appropriately used in hallways to locate doorways, specified landmarks, or intersecting halls.

When teaching cane trailing to a toddler, you need to consider which hand the child uses with the cane. Many toddlers alternate hands when using the cane since hand use is rarely established at this age. When a strong preference is shown, this should be considered when providing trailing instruction. The child should trail a wall that is opposite the hand holding the cane. For right-handed cane users, who trail on the left wall, this is not always practical in group childcare settings where children walk on the right side of the hallway. In this situation, the OMS in collaboration with the team should determine whether the setting is appropriate for trailing, whether the child should be encouraged to hold the cane in the left hand for trailing, or whether the child will only trail when the hallways are empty. If the team decides to encourage the child to switch hands for trailing, the child will need many opportunities to get used to using the cane in the left hand before beginning instruction in trailing.

Trailing is best taught using a miniroute to a meaningful location. Tell the child that you are going to walk with the cane to the identified location. Ask the child to stand with her arm next to the wall. The child should hold the cane in the hand that is away from the wall and place the cane in a modified diagonal position. The tip of the cane should be touching the corner where the wall and the floor meet. You may need to give the child verbal or physical prompts to position her body and the cane appropriately. Tell the child you want the cane to keep touching the wall as you walk. Walk with the child to the destination using verbal and physical prompts to keep the cane tip against the wall as necessary. The child should have a considerable foundation of experiences with hand trailing for short distances before being asked to trail with a cane or AMD. With this experience base, the child will easily understand the concepts and words associated with cane trailing. Help the parents and childcare providers to identify short routes at home and in the childcare setting in which trailing would be appropriate. Encourage the parents and childcare providers to keep miniroutes clear of obstacles and to have the child trail with the cane during the daily routines.

**Use with parents.** Using a cane is much more complex than using an AMD. Some children and families will be ready to use a cane as soon as it is introduced, though the child will benefit from continued instruction from the OMS. Other children will require several instructional sessions with an OMS before they are ready to use a cane with their parents. If a child is allowed to use a cane improperly (e.g., drag the cane behind him) for a week or two, it will be difficult to reteach the correct cane position. There are several different settings in which a child could begin to use a cane with other adults such as the TVI, with the parents, or at childcare. Determining when a child is ready to use a cane without the OMS depends on several factors: the child's level of skill with the cane, the willingness of the adult to allow the child to use the cane, and the ability of the adults to monitor cane use and give appropriate feedback. The OMS should use professional judgment to determine when a child should begin using a cane outside of

O&M lessons and should monitor the child's progress in using the cane with other adults.

Once it is determined that the child will use the cane with other adults, the OMS should provide guidance. When other adults are concerned about the child using the cane, the adult should select one or more environments or routes during which the child can use the cane. The OMS can verify that the environments or routes are appropriate for the child's level of skill or can suggest alternatives. Ideally, the child should use the cane in all appropriate environments. The OMS should remind the other adults of the one or two main skills the child is currently practicing (e.g., keeping the cane tip on the ground). The OMS must also stress that even though the child has a cane, it is still the adult's responsibility to monitor the child's safety. During each lesson, the OMS should ask how cane use is going and help brainstorm solutions to any problems that may arise.

### **Transitioning from AMD to long cane**

Some children learn to use an AMD and long cane simultaneously with frequent opportunities to choose which one to use. Other children, especially those with additional disabilities, use an AMD for months or even years before beginning to use a cane. Some children begin instruction with a long cane with no experiences with an AMD.

When a child is transitioning from using an AMD to using a long cane or is using both devices simultaneously, it is important not to assume that the child will automatically generalize skills from one device to another. If the child has established AMD skills and is transitioning to using the cane, begin by introducing the cane as described above and then move through initial and advanced lessons. Even if a child was able to avoid obstacles and detect drop-offs with an AMD, it will still take practice become proficient in these skills using the long cane. Be sure to provide adequate instruction at each level so that the child is safe and confident in using the cane.

## **K. Historical timeline of orientation and mobility**

Anthony (2004) summarized key events related to early orientation and mobility. The timeline is also included as Handout O.

### **Historical Timeline of Events and Publications Related to O&M for Children Ages 0-5 Years With Visual Impairments**

- |             |  |
|-------------|--|
| <b>1960</b> | The first university training program in the United States for orientation and mobility specialists is funded. |
| <b>1962</b> | The Vocational Rehabilitation Administration awards 30 grants to 22 states for the salaries of OMSs.           |

- Mid-1960s** The U.S. Office of Education begins to sponsor university programs that prepared OMSs to work with children and youth with congenital blindness and visual impairments.
- 1967** “Orientation and Mobility for Preschool Blind Children” by J.R. Eichorn and H.R. Vigaroso is published in the *International Journal for the Education of the Blind*, 17(2).
- 1967** “Developmental Concepts of Blind Children Between the Ages of Three and Six as They Relate to Orientation and Mobility” by L.B. Hapeman is published by the *International Journal for the Education of the Blind*, 17(2).
- 1969** First O&M certifications approved for professionals.
- 1977** *The Road to Freedom: A Parent’s Guide to Prepare the Blind Child to Travel Independently* by R. Webster is published by Katan Publications.
- 1977** *Move It!* by S. Raynor and R. Drouillard is published by the AAHPERD Promotional Department.
- 1978** *Get A Wiggle On!* by R. Drouillard and S. Raynor is published by AAHPERD Promotional Department.
- 1979** “Orientation and Mobility for Preschool Children: What We Have and What We Need” by K. Ferrell is published in the *Journal of Visual Impairment & Blindness*, 73(4).
- 1984** Peabody Preschool O&M Project (HCEEP Model Demonstration Project) is funded.
- 1984** “Preschool Orientation and Mobility: An Expanded Definition” by E.W. Hill, S. Rosen, V.I. Correa, and M.B. Langley is published by the *Education of the Visually Handicapped*, 16(2).
- 1986** “The Need for Motor Development Programs for Visually Impaired Preschoolers” by M.A. Palazes is published in the *Journal of Visual Impairment & Blindness*, 80(2).
- 1986** *The Development of a Program in O&M for Multihandicapped Blind Infants (Final Report)* by R.K. Harley, R. Long, J.B. Merbler, and T.A. Wood is published by the George Peabody College Press.
- 1986** *Move With Me: A Parents’ Guide to Movement Development for Visually Impaired Babies* is written and published by the Blind Childrens Center.

- 1987**      *Movement Analysis and Curriculum for Visually Impaired Preschoolers* by C. Brown and B. Bour is published by the Florida Department of Education.
- 1987**      “Children and Canes: An Adaptive Approach” by M. Kronich is published in the *Journal of Visual Impairment & Blindness*, 81(2).
- 1988**      *Preschool Orientation and Mobility Project for Visually Impaired Children* (Final Report) by E.W. Hill is published by Peabody College, Vanderbilt University.
- 1988**      “Precane Mobility Devices” by S.R. Bosbach is published in the *Journal of Visual Impairment & Blindness*, 82(8).
- 1988**      “Barriers or Enablers? Mobility Devices for Visually Impaired Multihandicapped Infants and Preschoolers” by K. Clarke is published by the *Education of the Visually Handicapped*, 20(3).
- 1988**      “A Home-Based Orientation and Mobility Program for Infants and Toddlers” by E. Joffe is published in the *Journal of Visual Impairment & Blindness*, 82(7).
- 1989**      *Pathways to Independence: Orientation and Mobility Skills for Your Infant and Toddler* by B. O’Mara is published by Lighthouse Press.
- 1989**      “Orientation and Mobility for Infants Who Are Visually Impaired” by E.W. Hill, B. Dodson-Burke, and B.A. Smith is published in *RE:view*, 21.
- 1989**      *Preschool Orientation and Mobility Screening* by B. Dodson-Burk and E.W. Hill is published by Division IX of the Association of the Education of the Blind and Visually Impaired.
- 1989**      *An Orientation and Mobility Primer* by B. Dodson-Burk and E.W. Hill is published by AFB Press.
- 1989**      “The Preschool Blind Child Can Be a Cane User” by R.L. Poggrund and S.J. Rosen is published in the *Journal of Visual Impairment & Blindness*, 83(9).
- 1990**      “Cane Travel for Preschoolers?” by D. Baxley is published in *Future Reflections*, 9(1).
- 1991**      “The Connecticut Precane” by C.J. Foy, D. Kirchner, & L. Waple is published in the *Journal of Visual Impairment & Blindness*, 85(2).

- 1991** “Current Practices and Considerations Regarding Long Cane Instruction with Preschool Children” by A.C. Skellenger & E.W. Hill is published in the *Journal of Visual Impairment & Blindness*, 85(3).
- 1992** “The Development and Evaluation of an O&M Screening for Preschool Children with Visual Impairments” by E.W. Hill, B. Dobson-Burke, and C. R. Taylor is published in *Education of the Visually Handicapped*, 16(2).
- 1992** “The Connecticut Precane: Case Study and Curriculum” by C.J. Foy, M. Schjeden, and J. Waiculonis is published in the *Journal of Visual Impairment & Blindness*, 86(4).
- 1992** *Reaching, Crawling, Walking ... Let's Get Moving: Orientation and Mobility for Preschool Children* by S.S. Simmons and S.O. Maida is published by the Blind Childrens Center.
- 1992** “Opinions of Orientation and Mobility Instructors About Using the Long Cane with Preschool-Age Children” by J. Dykes is published, *RE:view*, 24.
- 1992** “Movement Focus: Orientation and Mobility for Young Blind and Visually Impaired Children” by T.L. Anthony, D.L. Fazzi, J.S. Lampert, and R.L. Pogrund, in the book *Early Focus: Working With Young Blind and Visually Impaired Children and Their Families*, edited by R. Pogrund, D. Fazzi, and J. Lambert, is published by AFB Press.
- 1992** “Orientation and Mobility Skill Development” by T.L. Anthony is published in the book *First Steps: A Handbook for Teaching Young Children Who Are Visually Impaired* is by the Blind Childrens Center.
- 1993** “Development of a Preschool ‘Kiddy Cane’” by R.L. Pogrund, D.L. Fazzi, and E.M. Schreier is published in the *Journal of Visual Impairment & Blindness*, 87(2).
- 1994** “Travel Performance of Preschoolers: The Effects of Mobility Training With a Long Cane Versus a Precane” by K.L. Clarke, D.M. Sainato, and M.E. Ward is published in the *Journal of Visual Impairment & Blindness*, 88(1).
- 1995** *Standing on My Own Two Feet: A Step-by-Step Guide to Designing & Constructing Simple, Individually Tailored Adaptive Mobility Devices for Preschool-Age Children Who Are Visually Impaired* by L.L. LaPrelle is published by the Blind Childrens Center.

- 1995** “Orientation and Mobility for Young Children with Multiple Disabilities” by D. Fazzi is published in the book *Starting Points: Instructional Practices for young Children Whose Multiple Disabilities Include Visual impairment* by the Blind Childrens Center.
- 1996** “Preschool Orientation and Mobility: A Review of the Literature” by S. Leong is published in the *Journal of Visual Impairment & Blindness*, 90(2).
- 1997** *The Preschool Learner* by A.C. Skellenger and E.W. Hill in the book *Foundation of Orientation and Mobility* (2nd ed.), edited by B.B. Blasch, W.R. Wiener, and R.L. Welsh, is published by AFB Press.
- 1997** Reauthorization of the Individuals with Disabilities Education Act (IDEA), which includes language that defines Orientation and Mobility as an early intervention service under Part C and as a related service for students ages 3 to 21 years under Part B.
- 2001** The booklet *Where in the World Am I? How to Be Your Child’s First Orientation and Mobility Instructor* by K. Preece is published by Keystone Blind Association.
- 2002** “Facilitating Walking by Young Children With Visual Impairments” by S.S. Lowry and D.D. Hatton is published in *RE:view*, 34(9).
- 2002** “Motor Focus: Promoting Movement Experiences and Motor Development” by C.A. Strickling, and R.L. Pogrund in the book *Early Focus: Working With Young Blind Children and Visually Impaired Children and Their Families* (2nd ed.), edited by R.L. Pogrund, and D.L. Fazzi, is published by AFB Press.
- 2002** “Mobility Focus: Orientation and Mobility for Young Blind and Visually Impaired Children” by T.L. Anthony, H. Bleier, D.L. Fazzi, D. Kish, & R.L. Pogrund, in the book *Early Focus: Working With Young Blind and Visually Impaired Children and Their Families* (2nd ed.), edited by R.L. Pogrund and D.L. Fazzi, is published by AFB Press.
- 2004** *Developmentally Appropriate Orientation and Mobility* by T.L. Anthony, S.S. Lowry, C.J. Brown, and D.D. Hatton, multimedia curriculum resources for university personnel preparation projects is published by the Early Intervention Training Center for Infants and Toddlers With Visual Impairments at the FPG Child Development Institute, the University of North Carolina at Chapel Hill.

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