Conductive Education: A Functional Skills Program for Children with Cerebral Palsy

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ABSTRACT. Conductive education (CE) is an educational approach for children with cerebral palsy. This paper describes the history of conductive education, and the characteristics of current programs that exist in many countries. The underlying principles and the unique techniques used in CE programs are described. These include the role of the conductor or class leader; facilitations (teaching strategies) known as rhythmic intention, task series, and described equipment; and the structured program. The importance of the group setting and the impact on motivation, and the development of self-efficacy within each child are described. The perspective of children and families who pursue CE is discussed.

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The goals of medical and therapeutic services for children with cerebral palsy (CP) are to improve and maximize the child's functional potential and to prevent secondary complications of the CP. Rosenbaum (2003a) summarizes clinical considerations for children with CP and espouses family centered practice. Goal setting is based on collaboration with the child and family for efficient and effective outcomes. Rosenbaum describes CP as characterized by delayed gross motor function and many other possible co-existing conditions such as epilepsy, learning difficulties, and behavioral challenges. Medical, health, and educational professionals must be well informed about CP as the major cause of physical disability of childhood, and all of the interventions and management options available to families with children with CP. Children with CP are different and belong to families with individual needs and strengths, and therefore it is not surprising that different forms of support and intervention are sought and needed by such children and families.

Parents of children with CP value information about ways to help their child, and such information is associated with subjective feelings of well-being and empowerment in mothers (Green, 2004). Parents seek information from sources with varying degrees of accuracy, including each other, the internet, health professionals, and people working with their child and the many forms of media available to them–television, magazines, newspapers, books, etc. Internet support groups and the internet have become a popular and satisfying way for parents to locate information and gain emotional support (Baum, 2004).

One method of intervention that parents may investigate is conductive education (CE). Recent news media exposure about CE on the "60 Minutes" current affairs program aired to millions of people and created considerable public interest in the USA (Pelley, 2004). Sutton (1988) described the experience of CE being relatively unknown for a decade in Britain, and then interest exploded following the airing of a television documentary. Parents of children with cerebral palsy and adults who

have participated in CE programs have described the difficulty they encountered obtaining information about CE, as well as the misinformation that they did receive (Lind, 2003; Lindstrand, Brodin & Lind, 2002; Read, 1998). One problem that health, medical, and teaching professionals may encounter when a parent requests information about CE is the difficulty obtaining a description that is succinct and easy to understand, as well as objective information about the efficacy of this method (Rosenbaum, 2003b).

The purpose of this article is to provide an overview of Conductive Education so that professionals working with families may offer an accurate explanation, and so that researchers have an adequate description of this method to design efficacy studies. This descriptive article aims to provide an introductory overview of the history, underlying principles, characteristics such as the setting and staffing of programs, and descriptions of the unique techniques used within CE program. The evidence reviews and studies will be discussed briefly, with the reader referred to more detailed information through the cited sources.

BRIEF HISTORY OF CONDUCTIVE EDUCATION (1948-2005)

Conductive education is a system of education for children and adults with motor disabilities. Developed by Professor Andres Peto (1893-1967) in Budapest, Hungary, in 1948, CE provided an education for nonambulatory children who were excluded from mainstream school in Hungary at the time (Cottam & Sutton, 1986). The Peto Institute was the site of development for CE and continues to operate, teaching academic and motor function to students. Peto was succeeded in his role as Director of the Peto Institute by another physician, Dr. Maria Hari, from 1967 until 1990. Dr Hari authored a book on CE (Hari & Akos, 1971) which included much of Dr. Peto's work, and was translated into English in 1988. Both physicians believed that many children with cerebral palsy could learn to walk and perform all self-care tasks, if taught in the appropriate way, given proper instruction, motivation, and the opportunity to practice skills throughout the day.

Moving into Other Countries: Driving Forces

The CE has expanded internationally, mainly as a result of two driving forces. First, traditional therapists and health professionals visit and train at the institute and then establish programs in their country of origin.

In Britain, a physical therapist visited Budapest in 1970, and later the Birmingham Institute for Conductive Education was established and continues to the present day. In Australia, an occupational therapist studied at the Peto Institute in the mid-1980s and subsequent collaboration with therapists and teachers resulted in programs being established across the country (Cotter, 1995). In the United States, CE was introduced in the early 1980s by a pediatrician who had observed programs in London and described them to colleagues at the International College of Pediatricians in New York (Marx & Hanshaft, 1995). United Cerebral Palsy of New York City established the first CE-based program staffed by American therapists and teachers in 1989 (Marx & Hanshaft, 1995).

Parents of children with CP represent the second driving force that has resulted in the expansion of CE, particularly in Sweden and North America. In Sweden, parents initially invited Hungarian conductors to work with their children and eventually the Move and Walk Institute was established (Lindstrad, Brodin & Lind, 2002). In the United States, the vast majority of the existing CE centers (now in excess of one hundred) were established by parents of children with cerebral palsy. The situation in Canada is similar. Parents organized a summer camp program in 1993 and the year-round "Ability Camp" operational in Ontario, Canada, was started by a parent. The group Positive Action for Conductive Education (PACE) is run by parents, and runs other summer camps in Canada. In 1998, in Grand Rapids, Michigan, parents who had experienced success in their children's functional skills following attendance at CE programs run in Canada collaborated with Aquinas College's school of education to establish the Conductive Learning Center (Miller, 2001). This center directly affiliates with the Peto Institute. Aquinas College now offers a five year teaching qualification that will graduate the first group of elementary teacher and "conductor-teacher" professionals in 2005.

CHARACTERISTICS OF CURRENT PROGRAMS BASED ON CE

Outside Hungary, CE programs have been modified to suit the culture, social, educational, and medical system of the host country. This section will describe the settings that CE programs operate within, the staffing of such programs, and some of the underlying premises that characterize the programs.

Settings

Programs based on the principles of CE have been established in classrooms in a regular school, a classroom at a special school, an entire school, an early intervention setting, an independent clinical setting, and an after school or summer camp program (Darrah, Watkins, Chen & Bonin, 2004; Ludwig, Leggett & Harstall, 2000; NACE, 2004; Withall & Cotter, 1997). CE programs may also take the form of mother-baby groups that aim to educate and resource the mother in ways to promote motor skill development in the child (Reddihough, 1991; Robinson, Elliot, Watson & Brown, 1995).

Staffing

In the United States and Canada, centers tend to be staffed exclusively by Hungarian-trained conductors, although a center in the Chicago area is using a transdisciplinary model of CE with occupational and physical therapists working alongside conductor-teachers (Fiffer, 2000). In other countries such as Australia, Sweden, Hong Kong, and Britain, staff may be conductor-teachers, teachers, and occupational, physical, or speech therapists. Conductor-teachers may receive training at Aquinas College (Michigan, USA), University of Birmingham (UK), and at the Peto Institute (Hungary). In some countries, post graduate courses are available to therapists and teachers.

Disciplines such as teaching and the therapies may misunderstand CE and view its existence with skepticism and resistance (Lind, 2003; Reddihough, King, Coleman & Catanese, 1998). However, common ground exists between all disciplines, and a brief discussion of some of the main similarities and differences between CE and traditional therapy (occupational and physical therapies) is warranted.

The goals of both CE-based programs and traditional therapy provided in common settings (schools, hospitals, clinics, specialized centers) focus primarily on improving function for the child or adolescent. Traditional therapists are more often in the natural environment of the child–the school or the home, and thus have greater opportunity to facilitate participation in these settings. Recent evidence has demonstrated that the motor skills of a child with CP vary in different contexts suggesting that interventions should be delivered in the real-life contexts of the child (Tieman et al., 2004). Palisano, Snider and Orlin (2004) summarized some advances for children with cerebral palsy in the fields of physical and occupational therapy, including the dominant theoretical frameworks that

currently guide the professions. Several theoretical frameworks were described, and all emphasized a shift towards meeting the child's functional needs within the context of the wider environment of family, school, and community. CE programs tend to address the child's needs within the structure of the program, unless staffed by traditional therapists who are then able to apply principles and skills learned in the program to the wider context of the child's life (Withall & Cotter, 1997).

Palisano, Snider and Orlin (2004) described current best practice within traditional therapy to include interventions that improve adaptive functions, muscle strength and length, fitness, and prevention of secondary impairments. Major CE texts support these interventions also by allowing time to practice and repeat tasks within an active program; by attempting to improve motor control utilizing the facilitations described in this paper; by promoting stretching and strengthening muscles; by promoting the wearing of splints and orthoses; and by using task analysis and adaption of tools or parts of a task to promote function (Hari & Akos, 1971; Withall & Cotter, 1997).

Both do deliver integrated multidisciplinary treatment within groups, although such groups in traditional settings tend to occur mainly in early intervention. As is consistent with a philosophy that promotes the child's experiential learning, a conductor teacher may first direct the child verbally, and alter the environment so that a child achieves success in a task, rather than direct, manual handling. Conductor-teachers promote the child's goals in self-care, mobility, and social skills simultaneously, within the group program (Hari & Akos, 1971). Traditional therapists have specialized skills that result in expertise in specific aspects of the child's development, such as the occupational therapist being more concerned with upper limb function and the physical therapist attending to mobility issues. Traditional therapists are trained in the use of outcome measures and evidence-based practice, and work more closely with scientific and medical models. CE-based programs tend to refer to education-based models, unless staffed by traditional therapists who are evidence-based practitioners.

DESCRIPTION OF UNDERLYING PRINCIPLES OF PROGRAMS BASED ON CE

Conductive Education is delivered as a group program. The aim for participants is to enable development of an "orthofunction[al] personality" characterized by the "capacity for adaptation or learning which en-

ables him throughout life to adjust more and more to his natural and social environment" (Hari & Akos, 1971, p. 141). Orthofunction is considered the opposite of dysfunction.

The Learning Environment

The learning environment in a CE program is important for the progress of every child. The staff is responsible for creating a stimulating and supportive atmosphere that promotes enjoyment, participation and learning. The motivating environment is created by the group, the use of specific techniques termed "facilitations," and the routine that structures the CE program.

The group setting provides the child or adolescent with CP with a social context to form friendships and an accepting environment where time is available to practice tasks. Ideally children are grouped together according to age, and "background, abilities, needs and rate of progress" (Bairstow, Cochrane & Hur, 1993, p. 28). The group provides a source of motivation, support, camaraderie, and challenge for each individual child. Children in a group learn from each other by imitating strategies that similarly challenged children use to achieve a task. Within the group, the child learns that they can have a positive impact on their environment and achieve function. They develop a sense of responsibility for action and with that action comes self-efficacy. Hari and Akos (1971) show the inherent value of the group for the children calling it the "principal vehicle for interpersonal relations" and "an essential part of the practice of Conductive Education" (p. 205).

Children in the CE group learn through the use of "facilitations" that support their active achievement of the task at hand. Facilitations allow the children to carry out an activity through their own effort; it is "educational help, guidance in the use of methods and techniques for reaching a goal" (Hari & Akos, 1971, p. 186). Facilitations provide "just the right" conditions for success for the child to the best of their ability within the group, at that point in time. Examples include, how the conductor or teachers lead the activity, appropriate verbal and physical cueing, the use of rhythm and song to motivate, involve, and reinforce tasks, and the use of equipment for the child to sit, stand, lie down, and move in order for the child to do a task as independently as possible. The unique facilitations used in CE are described in the next section of this paper.

A CE program is a routine of activities that occur in sitting, standing, and lying down, with transitional movements embedded in the program to encourage smooth and natural transition between activities. Activities of interest and importance are practiced during the appropriate program. For example, eating, drinking, writing, or grooming tasks may be practiced during the sitting program, while taking one's socks off or rolling over is practiced in the lying program.

The Teaching Approach

Professionals working within CE programs utilize many teaching strategies in order for the child and group to progress. While some of these are discussed here, the reader is referred to Bairstow, Cochrane and Hur (1993) for a comprehensive description. The major expectation of the children is that they take personal responsibility and commit themselves for learning, problem solving, participation, perseverance, and a positive attitude. The conductor/staff member is to demonstrate a positive attitude, expect success and progress in the children, and create favorable learning opportunities. The children are positively directed towards strategies that may enable their success. In order to direct a child, the conductor/staff member must be skilled in observation to determine the causes of the child's difficulties. For example, if a child is holding a spoon and food falls before the child manages to eat it, the conductor will be aware of the many possible reasons that this has occurred. The conductor instructs the child in ways to achieve success, based on their assessment. If the difficulty is due to reduced control of the final degrees of wrist extension and forearm supination, the conductor may use a cue such as "I straighten my wrist. I turn the spoon up to my mouth" with other facilitations as required. The conductor reinforces what the child must do to achieve appropriate adaptation to the task demands, avoiding reprimanding the child's unsuccessful attempts.

Other teaching strategies include: children are as active as possible during the whole day; activities are goal-oriented, known to the child, and in line with their future; optimal use of facilitation to allow intention and success for the child; gradual withdrawal of facilitation as the child achieves and progresses; the time and opportunity to practice and repeat important tasks; and the opportunity to participate in both novel and challenging tasks to maintain attention and motivation as "straight repetition, fatigue or loss of attention must be avoided [as learning will no longer be occurring]" (Bairstow, Cochrane & Hur, 1993, p. 48).

Motor Learning: The Basis for Learning to Perform Tasks

Peto based much of his ideas about learning to move on the available works of Nicholai Bernstein (Hari & Akos, 1971). Bernstein (1896-1966) was a Russian scientist who studied human movement for over 30 years, and his work was regionally available. Bernstein's research was not available to the English-speaking world for several decades. His work is largely credited for providing much of the scientific foundations to the major motor learning theories that influence current treatment methods for traditional therapists. These are most commonly known as systems theory, dynamical systems theory, task-oriented approach and ecological theories of motor control (Shumway-Cook & Woolacott, 2001).

DESCRIPTION OF UNIQUE TECHNIQUES UTILIZED IN PROGRAMS BASED ON CE

Defining and describing the central techniques that are unique to CE is necessary for two reasons–to assist interested families to make an informed choice, and so that comparative efficacy studies may be designed (Darrah et al., 2004). For example, Reddihough (1991) defined four essential elements: educational philosophy; the conductor role; rhythmic intention and the use of song; and task-oriented structured programs. Later, in a randomized control study, Reddihough, King, Coleman and Catanese (1998) differentiated the CE programs from the control by contrasting differences based on these four elements.

As stated, CE-based programs are individualized to the host country's health and education system. Modifications occur so that the children and staff can share a common language, cultural customs, and an understanding of the wider contextual issues for children. Following examination of numerous sources, as well as experience comparing programs in different countries, the authors of this paper define and describe five techniques that are unique to CE (Bairstow, Cochrane & Hur, 1993; Hari & Akos, 1971; O'Connor, Pokfulam & Yu, 1998; Reddihough et al., 1998; Withall & Cotter, 1997). They are the conductor, rhythmic intention, the task series, the structured program, and the equipment used in a CE program. The reader seeking more detailed descriptions is referred to two textbooks co-authored by occupational therapists (O'Connor, Pokfulam & Yu, 1998; Withall & Cotter, 1997).

O'Connor, Pokfulam and Yu's is a resource book that includes a compact disk of songs frequently utilized in CE programs.

The Role of the Conductor

The "conductor" refers to the professional fulfilling a leading role in any program, as well as the professionally trained conductor teacher. Within the group, the conductor leads the group of children for any given part of the daily program as the teacher and the facilitator. The professional who "conducts" the group through the various activities for that particular session is aware of every child's individual needs, and incorporates them into the activities. Other professionals in the group assist the children with their participation, but the "conductor" leads with rhythm, songs and direction for the group. Utilizing a transdisciplinary model, the conductor may be from various disciplines–physical, occupational, or speech therapy, or education (Withall & Cotter, 1997).

Rhythmic Intention

The facilitation called rhythmic intention is the verbal self-direction that a child will say when attempting a task. Rhythmic intention capitalizes on the child's ability to learn through repetition, language, and rhythm. It involves use of rhyme and song in younger children and spoken description based on task analysis in older children to promote motor control during functional tasks (Reddihough, 1991). The purpose includes directing the child's intention and attention to the task at hand, to promote speech, and to bind the group together through the rhythm that the conductor sets for the group (Bairstow, Cochrane & Hur, 1993). The children use spoken language as a cue to assist in planning, execution, and completion of the motor requirements of a task. Through such strategy, inner language is engaged to break down the components of the task. Rhythmic intention can be considered to be feed-forward information for motor skills and has been described as the most powerful of the CE facilitators (Brown, 2004).

Withall and Cotter (1997) state that the aim of rhythmic intention is for the children to learn to use "self-talk to assist in problem solving their own learning of movement" (p. 21). This facilitation may take many forms including rhythmic speech with keyword repetition, counting, a song, or rhyme to reinforce movement. The type of language and the tempo of the language or song are dependent on the age, emotional, motor, and cognitive needs and abilities of the children. For example,

a group of five children may sit around a table to eat a snack, after making their own way to the table using rhythm, song, and verbal intention to mobilize as per their individual goals. Once seated, with the various equipment required to facilitate the seated position, the children will check and correct their positions together as a group. Led by the conductor, together they may sing (always in the first person), "My feet are flat (referring to heels down and foot perpendicular to ankle); my back is straight; my head is in the middle; and I am sitting tall!"

Such verbal intention may be followed by a song celebrating and reinforcing appropriate sitting posture, before the meal begins. The children learn to describe what it is their bodies need to do to achieve function within an environment. Once a skill is mastered, the aim is for the child to use this knowledge when involved in tasks outside of the CE setting. Continuing this example, the child may sit with able-bodied school peers to participate in an art activity. In such a scenario, the aim of the CE program is for the child to use internal language to check and correct their sitting position before beginning the art activity. The child may request assistance to achieve the position they want by asking for a foot stool or a lower table for their symmetrical sitting posture.

The Task Series

The task series is a facilitation that teaches children to gain control over their movements and to learn new movements that will result in improved functioning in daily activities of the program. Every child will have several task series that are addressed throughout the program (Bairstow, Cochrane & Hur, 1993). Withall and Cotter (1997) provide several useful examples in their curriculum guidebook. For example, a child with athetoid cerebral palsy may have excessive movements of the arms, legs, and head. The task series will be designed for this child in such a way as to promote the ability to control extraneous movements in different positions. During the lying program, the child will learn how to lie straight and still. During the sitting program, the child may be provided with a horizontal bar on the table top to hold on to in order to stabilize and control excessive movements in a seated position. Such skills are necessary for sufficient control to be achieved for accuracy in goal-directed movement, such as using one hand successfully to feed oneself.

Another example is a child experiencing difficulty achieving elbow extension to reach out for objects. One of their task series will be structured to provide them with many opportunities to practice elbow exten-

sion in the various activities and postures that the child does daily. Specifically, the child may put hands down by his/her side during a sitting routine, forward directly in front of them during a seated activity at a table, down by their sides holding on to rings when lying supine.

The Structured Program

All CE-based programs consist of a structured program of tasks related to functional mobility, self-care skill, and cognitive and social skill development. The structured program may be a daily routine or a shorter block of time such as a mother-baby group or after school program. The structured program is a routine of activities that meets the individual goals of each participant in the group. A routine of timetabled activities promotes the opportunity to build strength, endurance, to practice and to build on skills. The routine has "a student focus, a planned structure, opportunities for continual learning and practice of skills and [an] age appropriate, life skills emphasis" (Withall & Cotter, 1997, p. 19).

The structured program is designed to address the learning needs of the individual children in the group. Typically, a program will incorporate some mobility (walking/rolling, depending on the age of the child), toileting, and other self-care tasks such as eating and drinking as per the usual rhythm of the child's day. The program will also include a plinth or lying program, a sitting program, a standing program and a mobility program, with tasks practiced within each program. For example, the standing program may incorporate upper body dressing if this is appropriate for the members of the group, while the lying program may incorporate all transitional movements related to getting on and off a bed and other furniture or the floor. An example of an afternoon program of three hours duration for a 7-year-old child is as follows. The child arrives at a CE center and moves to the coat and bag area, removing their coat in standing, with facilitations as required. The child may then use the toilet and bathroom facilities accompanied by a staff member who facilitates optimum practice of the real tasks, before joining his/her classmates in the CE group. The program begins with a sitting group with the children facing each other in a circle and engaged in an activity together. A plinth/lying program and standing program may follow consecutively, before the child is required to practice mobility skills to arrive at an area where the children will eat an afternoon snack together. How every child in the group is set up to participate in each task depends on their individual needs and goals, and all aforementioned facilitations are utilized to pro-

mote individual learning. Finally, the child may be required to mobilize back to his/her bag, don his/her coat, and await transport home.

The Equipment Used in the Program

The specific design of the equipment used in a CE-based program promotes independence and self-efficacy in the child. Typical items seen within a CE-based program include wooden plinths that look like low slatted tables, wooden chairs with high ladder backs, wooden ladder back standing frames, wooden stools and blocks, parallel bars, steps, rods, plastic rings, arm bands, and large mirrors for the children to see themselves working.

The equipment is another facilitation that enables a child's learning. It is designed to promote the use of active grasp for attaining stability in different positions, and the use of the hands in many transitional movements. This may be achieved through the multiple opportunities to grasp ladder rungs on the back of chairs and stands, or horizontal rods secured to table tops and wooden slats that make up the tops of specially designed plinths. The equipment is multipurpose and highly adaptable to the body dimensions of the children in the group. For example, a chair may be adapted with wooden blocks so that every child who sits in it will have the correct seat depth and height for optimum active sitting posture.

EVALUATING RESEARCH INTO THE EFFICACY OF CE

The American Academy of Cerebral Palsy and Developmental Medicine (AACPDM) has published a comprehensive evidence report regarding the effectiveness of CE as an intervention for children with CP. This recent report reviews fifteen research articles that evaluate CE as an intervention (Darrah et al., 2004). The authors highlight the inherent difficulties of program evaluation and comparison with existing traditional therapies in host countries. They note that CE has been "packaged in an array of delivery models, making it difficult to ascertain specific criteria that define CE as a program [compared to CE in Hungary]" (p. 188). Critical factors such as staffing, duration of programs, age, diagnosis, and ability level of recipients of the service, are not held constant between programs. Difficulties arise when researchers attempt to set up comparison and control groups.

Of the 15 studies reviewed, only 4 were sufficiently scientifically rigorous to provide strong evidence on the efficacy of CE. The authors

noted the poor description of the intervention titled CE, inadequacy of measures that can detect the type of progress and learning that CE aims for, and absence of power calculations. In regard to the best evidence in the four studies, 20 statistically significant outcomes were revealed, 10 in favor of CE, and 10 in favor of the control groups. The outcomes in favor of the CE group included self-care, dressing and toileting–all skills taught in a CE- based program. The report concluded that the "present literature base does not provide conclusive evidence either in support of or against CE as an intervention strategy" (p. 202).

One study has been published subsequent to the AACPDM search dates. Stiller, Marcoux and Olson (2003) compared outcomes for three different interventions–CE (staffed by conductors only), traditional therapy (combined physical, occupational, and speech therapy individual and group sessions), and special education. The three interventions were time-matched over the five-week intervention period. Limitations within the study included small numbers of participants, nonrandom sampling and the short duration of treatment.

The study found that all 19 children made improvement. The only statistically significant findings related to self-care, social functioning and crawling and kneeling ability in the intensive therapy group. While the intensive therapy group demonstrated the highest rate of subscale improvements at a 10% level (i.e., scores for a specific skill were 10% better), more subscale improvements occurred at the 40% level in the CE, and special education groups.

In Canada, the Alberta Heritage Foundation for Medical Research completed an assessment report and critical appraisal of the evidence surrounding CE programs (Ludwig, Leggett & Harstall, 2000). This comprehensive review acknowledges that CE programs outside of Hungary manifest in different ways, depending on the host community/ country, and that all available efficacy studies evaluate these adapted CE models. The report found that "children in CE groups kept pace with their peers who received other types of therapy" (Ludwig, Leggett & Harstall, 2000, p. ii).

THE NEED FOR EVIDENCE-BASED PRACTICE IN CE PROGRAMS

All practitioners providing an intervention service for children with cerebral palsy must provide evidence to support the efficacy of their service. CE programs must comply with such standards, and they must be

inclusive of progress occurring within medicine and the health sciences. One such advance is the importance of addressing functional goals within the context that the task is most frequently performed (Lammi & Law, 2004). This would suggest that professionals do need to provide services within the child's natural context, and this includes practitioners working within a CE setting.

An example is evident in the change in approach to improve hand use in children with CP. Therapy goals have progressed from reducing impairment in the affected limb to models of practice that focus on increasing participation in specific activities using frequent practice of the exact task requirements in similar contexts (Boyd, Morris & Graham, 2001; Eliasson, 2003). Wider environmental issues have a major influence on the child's participation in activities at home and school, and in the community (King et al., 2003; Law et al., 1999; Schenker, Coster & Parush, 2005). Intervention to reduce task constraints and provide a more enabling environment for children with CP at home demonstrates improvement in the abilities of the child in identified tasks of importance (Lammi & Law, 2003).

WHAT ARE CHILDREN AND THEIR FAMILIES SAYING WHEN THEY CHOOSE CE?

A few studies have reported high satisfaction from families of children with cerebral palsy and adults who have participated in CE programs (Lindstrad, Brodin & Lind, 2002; Read, 1998). Health and education professionals report that families are generally satisfied with CE programs, and suggest that families have more direct servicing within CE programs compared to habilitation services that provide consultancy services (Lind, 2003). Families report their child's enjoyment, progress, the opportunity to meet other children, and families, as well as their child's improved motivation and attempts to gain functional skills, as the main reasons for choosing CE.

SUMMARY AND FUTURE DIRECTIONS

There has been an expansion and evolution of CE over the past 50 years. CE has been adapted by different cultures to fit with the different education and medical systems and exists in many forms, based on the original Hungarian model. CE is an intervention that directly seeks to

improve ability in activities of use in daily life. This paper has defined the principles that contribute to the participation of the children in meeting their functional goals within a CE-based program. Research must evaluate the efficacy of CE, as well as the extent to which children participating in programs are able to meet their own functional goals. It is the responsibility of professionals working within CE programs to support and conduct such efficacy studies. Qualitative studies would assist the field of developmental medicine to understand why consumers select CE as an intervention. Outcome studies must evaluate changes within participants in terms of body structure and function, ability in daily tasks, and participation in activities of choice in the child's life.

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