

BEST PRACTICES BY OCCUPATIONAL AND
PHYSICAL THERAPISTS PERFORMING
SEATING AND MOBILITY
EVALUATIONS

By

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TABLE OF CONTENTS

Chapter	Page
1. INTRODUCTION	1
Introduction	1
Healthcare	3
Assistive Technology	4
Healthcare and the Law	8
Rehabilitation Technologist	9
Seating and Positioning Specialist	11
Code of Ethics	12
Best Practices	13
Adult Learning	15
Andragogy	15
Self-Directed Learning	17
Learning How to Learn	18
Critical Reflection	19
Transformative Learning	21
Problem Statement	23
Purpose Statement	24
Research Questions	25
Definitions	25
2. LITERATURE REVIEW	28
Introduction	28
Disability Census	29
Assistive Technology	31
Healthcare and the Law	33
Rehabilitation Technologist	41
Seating and Mobility Specialist	42
Ethics	46
Best Practices	49
Adult Learning Principles	51
Real-Life Learning	51
Learning How to Learn	56
Reflective Practice	57
Transformational Learning	58
3. METHODOLOGY	62
Design	62
Delphi Technique	64
A Historical Perspective	64
The Process	66
Defining Expert	67
Sample	69
Questionnaire Development	72

Content Analysis	75
Data Collection	82
Data Analysis	83
4. ROUND 1 FINDINGS	85
Introduction	85
Experience	86
Knowledge and Experience	90
Follow-Up	92
Barriers	93
Technology	95
The Consumer	99
Summary	101
5. ROUND 2 FINDINGS	103
Introduction	103
Building Rapport	105
Communication	107
The Interview	109
Technical Skills	111
Knowledge and Experience	113
Networking	115
Experience and Training	116
Follow-Up	119
Experience Reiterated	120
Education	124
Barriers Overcome	126
6. SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS	130
Summary	130
Purpose	130
Design	132
Findings	134
The Wheel	135
Experience	136
Hands on Techniques	139
Skills	141
Technology	144
Resources	145
Self-Directed Learning	146
Follow-Up	149
Consumer Relations	150
Barriers	152
Summary	153
The Wheel in Motion	154
Occupational and Physical Therapy Practitioners	155

Professional Organizations	159
Funding and the Consumer	160
Summary	162
REFERENCES	164
Appendix	174

LIST OF TABLES

Table	Page
Table 1: Distribution of Expert Panel	73
Table 2: Frequency and Mean of the Necessary Components Utilized in a Seating and Mobility Evaluation	112
Table 3: Frequency of Utilized Learning Opportunities	124
Table 4: Beneficial Rating of Learning Opportunities	126

LIST OF FIGURES

Figure	Page
Figure 1: The Wheel of Best Practices in the Area of Seating and Mobility	137

CHAPTER 1

INTRODUCTION

Introduction

"What is the way?" a monk questioned his spiritual master. "The way is your daily life" the master replied. Daily life or the activities of daily living are something that most people take for granted. For most people, getting out of bed and the immediate tasks which follow are completed in an automatic and routine mode and are thus taken for granted. A person with a physical disability, however, is unable to take these things for granted. These daily activities can be time consuming and energy draining tasks, and they can even be impossible without the right resources. However, it should be noted that a handicap only occurs when a person with a disability is unable to fulfill his normal role in life. A handicap is not a characteristic of a person; it is a description of the relationship between the person and the environment (Cook & Hussey, 1995, p. 5). Thus, although a person may have a disability, they may not have a handicap with proper resources. This approach, which shifts the handicap from the individual to the environment, provides an important perspective on the role of assistive technologies in reducing the effects a disability can have

on an individual.

Assistive technology is one resource which can be utilized to prevent a handicap. Persons with physical disabilities use assistive technology and education to meet their various needs. The quality of the assistive technology can make a remarkable difference in the user's quality of life. For example, when the disability limits a person's ability to walk, the person is dependent on a wheelchair for mobility.

Assistive technology and durable medical equipment are terms that describe different functions and are distinguished from each other in several ways. Durable medical equipment can be purchased by any individual at any medical equipment retailer. No special training is required to prescribe or sell durable medical equipment. Examples of durable medical equipment are walkers, tub benches, scooters, and simple folding wheelchairs. On the other hand, assistive technology is specified in response to information gathered through a professional team-based evaluation. This team will typically include the consumer and a family member or care-giver. It may also include a physician, physical therapist, occupational therapist, speech/language pathologist, nurse, teacher, employer, case

manager, payer, and equipment vendor. Any combination is possible; what is most important is that all aspects of the technology needs of the individual are addressed (Angelo, 1997, p. 6).

In the assistive technology team, the role of the team leader is most often played by either an occupational therapist or a physical therapist who has experience and training in this highly specialized area. When the therapist is taking on this role as the team leader, the therapist would be identified by a more generic title which would cover either discipline. This person would thus be identified as the rehabilitation specialist. Many payers, such as Medicaid or insurance companies, even require that the rehabilitation specialist complete the specific prescription for the assistive technology equipment. Thus, rehabilitation specialists fill an important need in present day healthcare.

Healthcare

The healthcare field is a rapidly growing and changing field. A significant portion of the population have impairments which greatly limit their abilities. These impairments may be acquired at birth, through accident or disease, or through the aging process. One reason for this

growth is that the infant mortality rate has decreased. Also of significance is the population as a whole is growing older (Vanderheiden, 1991). With the changes in technology and the health care system, infants who previously did not survive prematurity are now surviving. However, their survival is not always without complications. As a result of these complications, these infants often have disabling conditions that leads to the need for increased health care and assistive technology. These conditions impact millions of people in the United States.

The United States Census Bureau (1997) indicates that large numbers of people in society are labeled as living with a disability. The Bureau more specifically found that 19.7% of the population had some level of disability, and 12.3% of the population had a severe disability; 3.8% of these individuals needed personal assistance with one or more activities of daily living. Most of these individuals needed some sort of assistive device such as a wheelchair, walker, or cane to assist them with mobility.

Assistive Technology

Technology can make things easier for most people. For people with disabilities, however, technology makes things possible (Radabough, 1990). Assistive technology refers to

a broad range of devices, services, strategies, and practices that when applied limit the problems faced by people who have disabilities (Cook & Hussey, 1995, p. 5). Some examples of assistive technology devices include adapted computers, environmental control systems, and custom prescribed wheelchairs and seating systems. Such assistive technology equipment works in combination with the human developmental process to assist people who are living with disabilities with life functions.

Assistive technology does not just refer to a set of devices or equipment. Assistive technology is also considered a field of practice. Public Law 100-407 defines an assistive technology service as any service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device (Cook & Hussey, 1995, p. 6).

The acquisition of human functional skills occurs through a developmental process. Skilled movement requires complex patterns of muscular coordination. All movement requires constant change of posture and adjustment through the center of gravity. For example, upper extremity or arm functions such as reaching, grasping, and manipulating objects are not as simple as one might initially think.

Developmentally, the pelvis must first be aligned and stable before such functions can occur. Skilled arm and hand movements also require a dynamically stable sitting base, which allows weight shifting during the reaching task. Tasks such as reaching, grasping, and manipulation of objects requires dynamic stability of the shoulder girdle on a stable trunk. Thus, all parts of the body are connected with the pelvis as the central point (Hypes, 1988, pp. 189-209). Poor spinal stability can result in excessive flexion or extension of trunk or legs and asymmetries which can lead to deformities. Without good sitting balance, the hands are not free for manipulation in self-care skills such as eating and dressing or in school and work related activities such as writing (Neistadt & Crepeau, 1998, p. 584).

A primary prerequisite for the functional use of most technical aids is proper positioning, and this is usually in a seated position. The seated position is often the most functional, practical, and socially acceptable position in a school or work setting (Taylor, 1987, p. 711). For this reason, a wheelchair and seating system is prescribed for people living with a disability.

One very important aspect of assistive technology is the wheelchair. The wheelchair not only provides a means of

mobility to the end user, but it should also provide support and comfort and should increase, maintain, or improve functional skills. A person with complex seating and positioning needs may need extensive external support and control. A properly prescribed wheelchair can often provide this support. The wheelchair that is properly prescribed can enhance a person's ability to be independent in the community.

Wheelchairs have changed dramatically since their conception. Early wheelchairs were made of wood and cane and were large, heavy, and cumbersome. Typically, the wheels were difficult to reach and thus could not be pushed by the user. The chair's design assumed that the user would always be dependent on others for assistance. The idea of a wheelchair for an active user was a foreign concept. Fortunately, with the advances in technology, modern wheelchairs have been improved substantially. Vast improvements have been made during the last 10 years and continue to be made on an ongoing basis. Today's chairs offer variety, flexibility, increased physical comfort, and independence. Designs also take into consideration the many different lifestyles and physical needs of users as well as their right to ride with dignity.

A wheelchair should be a tool of liberation and not one of confinement. The recent evolution in design and technology has resulted in a chair and seating system which can offer a level of comfort, activity, and independence that many thought impossible. With this form of assistive technology, people with severe disabilities can actively participate in society (Karp, 1998, p. 3). Although a person may have a disability, a handicap can be avoided.

A handicap results when the individual with a disability is unable to fulfill what is considered one's normal role in life. A handicap is not a characteristic of an individual. A handicap is a description of the relationship of an individual and the environment (Cook & Hussey, 1995, p. 5). Technology can assist in preventing a handicap. The need for this technology has been recognized, and as a result, several laws have been written and implemented.

Healthcare and the Law

Laws governing individuals with disabilities first stemmed from the Civil Rights Act of 1964. One of the most recognized laws, the Americans with Disabilities Act (ADA) (Public Law 101-336), is a federal anti-discrimination statute designed to prohibit discrimination on the basis of

disability. The act's procedures and remedies are identical to those under Title VII of the Civil Right Act of 1964 and the Rehabilitation Act of 1973 (Rothstein, Roy, & Wolf, 1998, pp. 2-8).

One of the most recent and important laws which has made a significant impact on individuals with disabilities and their access to assistive technology was signed by President Clinton in 1998. This law is known as the Assistive Technology Act of 1998 (ATA) (Public Law 105-394). The ATA extends funding and support to develop permanent, comprehensive, statewide programs of technology-related assistance (Rothstein, Roy, & Wolf, 1998, pp. 2-8). This support of funding facilitates the acquisition of assistive technology. Assistive Technology is a complex and consistently changing field. Trained professionals are essential to the provision of assistive technology services. Therefore, the availability of trained professionals to complete thorough, skilled assessments is a necessity.

Rehabilitation Technologist

The technologist is an individual who has the technical training to efficiently evaluate, set up, adjust, and modify technologies. A rehabilitation technologist should have these technical skills plus an extensive knowledge of

disabilities and the implications of the disabilities. Thus, technologists with these skills can match the needs and limitations of a person with a disability with the appropriate technology (Vanderheiden, 1987, p. 708). Occupational and physical therapists understand the medical and physiological choices that affect a person with a disability.

Occupational therapy is the art and science of helping people to do the day-to-day activities that are important to them despite impairment, disability, or handicap (Neistadt & Crepeau, 1998, p. 5). Typically, occupational therapists provide a holistic approach to a consumer's need, which can often be neglected when the primary focus is on technology (Trefler, 1987, p. 697). Physical therapists evaluate physical capacities and limitations, and they administer treatment designed to alleviate pain, correct or minimize deformity, increase strength and mobility, and improve general health (Neistadt & Crepeau, 1998, p. 793).

Assistive technology service delivery can be more effectively delivered when a transdisciplinary team approach is used. In a transdisciplinary team approach, there is crossing over of professional boundaries and sharing of roles and functions (Cook & Hussey, 1995, p. 34).

Occupational and physical therapists typically share roles and functions on the assistive technology team. Both physical and occupational therapists have a thorough knowledge in anatomy, bio-dynamics, and the human developmental process. Because of the educational process, occupational and physical therapists have a thorough understanding of disabilities. The effective practice of these therapists requires that they have keen observation skills which can be utilized in the evaluation process. The therapist ascertains the consumer's environmental needs, seating needs, and functional abilities (Taylor, 1987, pp. 712-713).

Seating and Positioning Specialist

Therapists are trained to evaluate and thus assist the consumer in obtaining the appropriate equipment. Therapists should be familiar with the therapeutic guidelines for positioning and seating. For example, positioning usually begins with the support of the pelvis and then continues to the thighs, the trunk, the head, the shoulders, and the legs. These guidelines help therapists to use a systematic approach during their evaluation process. Therapists are trained on the specific requirements and demands required to propel a wheelchair.

All therapists work under a code of professional ethics. Specialists prescribing wheelchairs or other assistive technology items must comply with the code of ethics for their discipline. Specialized credentialing is available for those therapists wishing to specialize in this field. However, many agencies such as insurance companies, Medicaid, or Medicare, which have the ultimate say in what assistive technology or mobility product a person receives, do not recognize such credentialing. Therefore, there is no quality assurance or system established which assures that the person making the recommendations has the skills or knowledge needed in this complex field. Thus, consumer protection is not present.

Code of Ethics

Ethics is defined as the study of standards of conduct and moral judgment or code of morals which guide a particular professional (McKechnie, 1983, p. 627). When applied to a field of professional endeavor such as assistive technology delivery or to professions such as occupational or physical therapy, the ethical conduct of the practitioners is established both in codes of ethics and in standards of practice.

The code of ethics for a discipline is typically

developed by the professional associations. Standards of practice prescribe more specifically what is and is not considered to be good practice in a given discipline (Cook & Hussey, 1995, pp. 35-36). An occupational or physical therapist may be required to complete the wheelchair evaluation process; however, if the therapist is not trained to properly administer the assessment, an ethical dilemma may occur. Best practices are one way of establishing the quality of services within a field.

Best Practices

"Best practices are a professional's decisions and actions based on knowledge and evidence that reflect the most current and innovative ideas available" (Dunn, 2000, pp. 1-2). What is best practice today evolves into standard practice in the future. This is how knowledge advances in a profession. Professionals have a particular knowledge base which enables them to assess a situation and to determine what is needed. Individuals look to the professional to have the knowledge and skills needed to provide the best service possible (pp. 2-6).

Identifying the best practice of the rehabilitation specialists are important for several reasons. Physical and occupational therapy higher education programs are mandated

to provide the best educational opportunities of the highest standards. Best practice determination can assist in helping to quantify the guidelines for the educational process. By including the factors considered to be best practice, faculty members can ensure that they are providing a curriculum which is based upon the current best practice research.

Continuing education programs can use information based on this knowledge and develop courses that focus on therapists' needs. Practicing therapists can assess and compare their own skills to identify best practices. They can ask themselves if they are incorporating all or some of the best practice components recommended. Therapists who want to change areas of practice or enhance their current skills may also find this information valuable.

Identifying best practice provides justification for conducting assistive technology and mobility evaluations in a certain manner. To funding agencies, identifying best practice provides a rationale for the reasons why evaluations can sometimes be time-consuming and costly. Healthcare administrators can use such information in quality assurance programs. Lastly and possibly most importantly in the ever-changing healthcare field, this

information on best practice can be utilized to assist in identifying services that are of highest quality.

Adult Learning

Established adult learning principles can add meaning and insight to the learning processes of occupational and physical therapists. Learning is a difficult word to define. However, experts in the field have come to agree that it involves several highly complex processes. These processes involve the mind, the emotions, and the total self, or one's entire being (Smith, 1982, p. 34). These learning principles such as andragogy and self-directed learning, learning how to learn, critical reflection, and transformative learning are keys in the field of adult education. When these concepts are identified and recognized in the therapy field, they can be instrumental in assisting with the acquisition of best practices.

Andragogy

Because of the advances in technology, lifelong learning is absolutely essential. This is not only evident in the world but also in the field of assistive technology. Occupational and physical therapists play a valuable role in the assessment process for such technology, specifically wheelchairs and seating systems.

Malcolm Knowles revolutionized the field of adult learning through the advancement of the concept of andragogy. Knowles (1980) defines andragogy as "the art and science of helping adults learn" (p. 43). Pedagogy, the art and science of teaching children, views the educational experience more traditionally and is thus more teacher-centered. With the pedagogy model, the control of learning rests mainly with the instructors who direct the process from their perception. The andrological model assumes that adults are active learners. In andragogy, learners are the directors of their learning processes and needs.

The concept of andragogy is based on a set of assumptions about the learner. Knowles' (1980) model was originally based on four basic assumptions of adult learners. As people develop:

- Their self-concept moves from one of being a dependent personality toward one of being a self-directed being.
- They accumulate a growing reservoir of experience that becomes increasing resource for learning.
- Their readiness to learn becomes oriented increasingly to the developmental tasks of social roles.
- Their time prospective change is one from one of postponed application of knowledge to immediacy of application, and accordingly, orientation toward learning shifts from one of subject-centeredness to one of performance-centeredness. (pp. 43-44)

In 1984, Knowles (1998) added the fifth assumption that as a person matures, the motivation to learn is internal (p. 68). Finally, he added the six assumption that "adults need to know why they need to learn something before undertaking to learn it" (p. 64).

Self-Directed Learning

Knowles (1975) defines self-directed learning as "a process in which individuals take the initiative, with or without the help of others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes" (p. 18). Self-directedness is critical to andragogy; all other principles revolve around this concept.

Individuals in self-directed learning settings are valued for their past experiences. This experience is what led them to the learning settings. Adults want to learn knowledge or skills that are relevant to their current lives, career choices, or hobbies. Additionally, they want immediate application of this information. Because every individual occupies a unique role in a different place in time, learners will

differ on when and how they seek this knowledge and what this knowledge will be (Knowles, 1975, p. 20). Adult learners are motivated by several factors outside of grades; these factors can include health, self-esteem, curiosity, career advancement, or the need for a challenge (p. 21). Self-directed learning can be utilized to improve one's competence in the learning process. Physical or occupational therapist may personally choose to further their education. If they are working in the field of assistive technology, this may be an ongoing educational experience due to the constant changes in the field.

Learning How to Learn

Because lifelong learning is an absolute must, learning how to learn plays an important part in a therapist's continual acquisition of new skills. Being adaptive and creative and learning how to learn are powerful in whatever situation adults encounter (Smith, 1982, pp. 15-16). "It is as important to teach adults how to learn as it is to specify particular curricular domains for learning" (Brookfield, 1986, p. 64). "Understanding the concept of learning how to learn is more important than establishing a definition.

Learning how to learn happens in everyday lives, yet little research about learning how to learn outside of formal education exists" (Ghost Bear, 2001, p. 36).

The learning how to learn theory has three components. These components include the following: learners needs are what the learner needs to know, learning style is how a learner prefers to learn, and training refers to activities or instructions which improve a person's competence and learning (Smith, 1982, p. 18). The occupational or physical therapist must address all three of these areas. A knowledge of best practices can help the therapist determine what learning is needed.

Critical Reflection

Critical reflection refers to challenging the validity of presuppositions in prior learning. This process allows the learner to self-reflect on skills learned (Mezirow, 1990, p. 12). "In developing the skills, learners would gradually become aware of forces and structures that were keeping them in a position of dependence. Central to this concept, however, is a process long ago recognized as fundamentally educational by such philosophers and educators as Dewey

(1916) and Neil (1960)" (Brookfield, 1986, p. 15). This process encourages the learner to engage in an educational opportunity followed by reflection, followed by further investigation and exploration, and then followed by further reflection. "It means that explorations of new ideas, skills, or bodies of knowledge do not take place in a vacuum but are set within the context of learners' past, current, and future experiences" (Brookfield, 1986, p. 15). With this style of learning, learners have the opportunity of becoming better acquainted with their knowledge base, applying this knowledge base to their area of practice, reflecting back on the results, and redefining how these skills might be modified, and thus they can apply these modifications.

This style of learning has been identified and defined by Donald Schon. In 1983 and 1987, he describes the professional's ability to "think on their feet". This process can be considered reflection-in-action. Learning by doing and the need for continued learning and problem solving throughout one's professional career is crucial for most professionals. Skillful professional practice often depends on one's ability to

reflect before taking action. This art of reflection-in-action coincides with knowing-in-action. The practitioner's ability to balance reflection-in-action with knowing-in-practice is an important aspect of this adult education principal.

In occupational and physical therapy training programs, students become familiar with basic therapy skills. The students are then given the opportunity to observe and possibly practice these skills under the supervision of a licensed therapist. They are typically given the opportunity to reflect upon the skills learned with the supervising therapist and in the school setting. They have the opportunity to redefine their skills and to work again under a licensed therapist. Practicing therapists often utilize these reflective-in-action and knowing-in-practice skills as they proceed to gain further professional knowledge.

Transformative Learning

Reflective learning includes continual assessment and reassessment of assumptions. Reflective learning changes to transformative learning whenever assumptions or thoughts are found to be invalid. "Transformative learning results in new or transformed meaning schemes

for, when reflection focuses on premises, transformed meaning perspectives. To the extent that adult education strives to foster reflective learning, its goal becomes one of either confirmation or transformation of ways of interpreting experiences" (Mezirow, 1991, p. 6).

Perspective transformation is achieved through a process. This process includes becoming critically aware of how and why beliefs and assumptions often limit the way one perceives and understands things. Changing belief systems can increase one's awareness and inclusiveness and thus individuals can make more educated choices upon this new knowledge (Mezirow, 1997, p. 167). This transformation process can have a remarkable effect on the services delivered by an occupational or physical therapists. Most physical and occupational therapists have chosen this field because they want to make a difference in people's lives. The assessment and provision of assistive technologies is just one area in which a therapist can practice. However, in this technologically-driven environment, the person-centeredness of the profession can often be forgotten. Through the utilization of best practices,

the needs and concerns of the individual can be better served.

Problem Statement

The life-span of humankind is increasing. However, this increased life span does not come without certain complications. An increase in survival rate has also led to an increase in the existence of a number of individuals with severe disabilities. Ironically, technology can be a double-edged sword. On the one hand, it may cause an increase of problems; on the other hand, it may also be a solution to many of these problems.

Assistive technology in the disability field may mean the difference in a person being labeled as handicapped and dependent on another person versus being an independent and functional member of society. A wheelchair is one form of such technology. Currently, there are no nationally set standards for wheelchair prescriptions. Anyone can hang a sign on the door and call themselves a wheelchair vendor. There are also no set standards as to who will determine what wheelchair or components of a wheelchair that a person needs. It is often the occupational or

physical therapist who has been given the responsibility of prescribing the wheelchair. However, in the ever-changing field of technology, it can be difficult to stay up-to-date on this technology unless one chooses to specialize in it. Credentialing has been established which would identify those therapists with such expertise; however, it is not required. One way in which the therapists' expertise level can be assessed is by identifying the best practices in the field. Currently, there are no standards of best practices which would aid the therapist in establishing expertise in wheelchair evaluations. The lack of best practice standards creates a gap in the healthcare delivery system. Furthermore, once best practice standards are known, they can be taught to other professionals in order to close the gap.

Purpose Statement

The purpose of this study was to describe the perceptions of occupational and physical therapists who specialize in seating and mobility evaluations about the current best practices in the field. The focus was placed on determining best practices of the leaders in the field. This was accomplished by using the Delphi

technique to gather data from the leaders in the field regarding their perceptions of best practices in the area of seating and mobility. The Internet was utilized for the collection of the data. Following the collection of the data, content analysis was utilized for objective and systematic analysis of the data.

Research Questions

The following research questions were addressed in the study:

1. What skills are needed to adequately perform wheelchair assessments?
2. What do occupational and physical therapists who are practicing in the field of assistive technology consider to be best practices?
3. How are these skills for best practices acquired and how are they maintained?
4. What method should be utilized for delivering continuing education opportunities to therapists?
5. What are the perceptions of these therapist regarding future professional challenges?

Definitions

Activities of Daily Living - Self maintenance tasks required for independent living. (Neistadt & Crepeau, 1998 p. 188).

Adult Education - Adult education is a process whereby persons whose major social roles are characteristic of adult status undertake systematic and sustained learning activities for the purpose of bringing changes in knowledge, attitudes, values, or skills (Darkenwald & Merriam, 1982, p. 9).

Assistive Technology Device - Any item, piece of

equipment or product system, whether acquired commercially, modified, or customized that is used to increase, maintain, or improve functional capabilities of individuals with disabilities. PL (public law 105-394) 105th congress.

Assistive Technology Service - Any Service that directly assists an individual with a disability in the selection, acquisition, or use of an assistive technology device. (Angello, 1997, p. 226).

Best Practices - A professional's decisions and actions based on knowledge and evidence that reflect the most current and innovative ideas available (Dunn, 2000 pp. 1-2).

Delphi Technique - Is a method of inquiry based on a structure process for collecting and distilling knowledge from a group of experts by means of a series of questionnaires interspersed with controlled opinion feedback (Wilhelm, 2001, p. 6).

Disability - Results when the impairment leads to an inability to "perform an activity in the manner or within the range considered normal for a human being" (e.g., difficulties in communicating, hearing, moving about or manipulating objects). (World Health Organization WHO 1980) (Cook & Hussey, 1995, p. 5).

Expert - Someone who knows a great deal about what is being experienced. The expert brings more knowledge to solving problems effectively and at a deep level Merriam & Caffarella, 1999, pp. 206-207).

Occupational Therapy - The use of purposeful activity or interventions to promote health and achieve functional outcomes. (Neistadt & Crepeau, 1998, p. 5).

Physical Therapy - A person in the health care field who looks at the total system of care that includes client examination, client assessment, treatment planning, treatment application,

assessment of the treatment effect, and modification of the treatment as needed (Gould, 1990, p. 169).

CHAPTER 2

LITERATURE REVIEW

Introduction

A sizable number of persons with disabilities are currently present in the world. Approximately 49 million Americans, or one in seven, have an impairment that limits their daily activities (Brandt & Pope, 1997). Twenty-five percent of this population are so severe that they cannot work or participate in their communities (Baum & Law, 1997). Adolph Meyers, (1992), who was a notable psychiatrist, neurobiologist, and professor, was a strong advocate in the valuation of time, work, and the role of performance, and completion in bringing meaning to life (p. 6).

He emphasized his view of the importance of doing to achieving self-fulfillment by pointing out that "man learns to organize time and he does it in terms of doing." In an address given at the Fifth Annual Meeting of the National Society for the Promotion of Occupational Therapy in Baltimore Maryland, in 1921, Meyers proclaimed a concern for quality of life and suggested a clear relationship between the ability to perform daily occupations and one's self-satisfaction.

It is through the process of investigating, trying out, responding, creating, and controlling that an individual comes to know the potential and limitations of self and the environment and achieves a sense of competence and intrinsic worth (Fidler & Fidler, 1978, p. 306). When a person has a disability and requires the use of a wheelchair for mobility, the potential for this self-actualization process can be difficult. However, with a properly prescribed seating system, the effects of the disability can often be minimized.

Due to the educational background of occupational and physical therapists in bio-mechanics, human development, and disabilities, they are typically called upon to be the team leader and prescribe the wheelchair and mobility system. This can often pose an ethical dilemma if the therapist is not properly skilled and trained in this highly specialized field of practice.

Disability Census

Approximately one in five Americans have been identified as having some kind of disability, and one in ten have been identified as having a severe disability (CENBR, 97-5). Statistics have shown that

the chances of having a disability increases with age. If current trends continue, Americans 65-years old and over will make up 20% of the total population by the year 2030 compared to the 12% of the population they represented in 1997 (CENBR, 97-5). Not only does one's chance of having a disability increases with age, but the likelihood of having a severe disability also increases significantly with age (McNeil, 1997). Therefore, the numbers of individuals with disabilities will continue to rise.

The Center for Disease Control and Prevention (CDC) has taken these numbers a step further and estimated the number of people in the U.S. household population who will utilize assistive technology devices. The results of the CDC (1997) study are as follows:

An estimated 7.4 million persons in the U.S. household population used assistive technology devices for mobility impairments, 4.6 million for orthopedic impairments (including missing limbs), 4.5 million for hearing impairments (not including impairments fully compensated by hearing aids), and 0.5 million for vision impairments. Use of any mobility device for all ages had the highest prevalence rate at 28.5 per 1000 persons. There was a positive correlation between an increase in age and an increase in the prevalence rate of device usage; for example, of persons in age group 65 years and over, the rate of mobility, hearing, and vision device usage was more than four times

the rate for the total population.

Technology has come to play an increasingly important role in the lives of all people in the United States. Technology is utilized for business, for government functions, for communication, for the implementation of commerce, and in all aspects of education. The impact of the use of technology upon more than 50,000,000 individuals with disabilities in the United States has been comparable to its impact upon the remainder of the citizens of the United States. These breakthroughs in biomedical and technological sciences have changed the world. These breakthroughs not only provide the potential for longer and more fulfilling lives for individuals with disabilities they have also facilitated civil rights advocacy for these individuals (National Center for the Dissemination of Disability Research).

Assistive Technology

Technology can be defined as:

(1) the application of science esp. to industrial or commercial objectives. (2) the body of knowledge available to a civilization that is of use in fashioning implements, practicing manual arts and skills, and extracting or collecting materials (Webster, 1995, p. 1132).

This definition of technology places the emphasis on the

application of a service. However, when the term technology is used in reference to assistive technology, it is typically referred to a broad range of devices, services, strategies, and practices that are developed and applied to assist individuals who have disabilities (Cook & Hussey, 2002).

One of the most widely used definitions for assistive technology is provided in Public Law 100-407, the Technical Assistance Act.

This law defines an assistive technology device as any item, piece of equipment or product system whether acquired commercially or off-the-shelf, modified, or customized that is used to increase, maintain or improve functional capabilities of individuals with disabilities.

This definition emphasizes the importance of providing technologies that result in increased function for individuals with disabilities. Also of importance is its emphasis on individuality. No two individuals are the same, nor are 2 applications exactly the same in terms of the needs or skill level of the individual being served. Thus, there are no cookie cutter answers in the field of assistive technology. Public Law 100 - 407 also defines an assistive technology service as

Any service that directly assists an individual with a disability in the selection, acquisition or use of assistive technology device.

Assistive technologies are developed and prescribed to meet a variety of needs. The needs may be many and require extensive technology or they may be few and only require a minimal amount of technology. The technology devices may range from low-tech (modified pencils or eating utensils) to high-tech (computers and power wheelchairs). The assistive technology may also be utilized on a continuum from only at times to assist with a task such as with the use of a cane to continual use such as with the use of a wheelchair. Regardless of the type of technology utilized, the outcome does not change. This outcome is to maintain or improve functional capabilities of individuals with disabilities.

Thus, assistive technology equipment and services have increased because of population size, age composition, and an increase in the rate of use. Medical and technological advances play only a part of this increased usage. Public policy initiatives have also played a large contributing factor to increase usage (Russell, Hendershot, LeClere, Howie, & Adler, 1997).

Healthcare and the Law

Technological advancements and competition have driven the more recent development of assistive technology devices. Also of significance is the impact of federal legislation.

The delivery of assistive technology services has been most positively affected by federal legislation (Cook and Hussey, 2002). For over 20 years, All new federal legislation affecting individuals with disabilities has mentioned assistive technology as an important service delivery component (DeRuyter, 2002).

The Rehabilitation Act of 1973 (Amended) was responsible for establishing several important principles on which subsequent legislation has been based. The concept of reasonable accommodation is one of the most important principles which was established by this act. The act mandates that institutions of higher education and employers which receive federal funds seek to accommodate the needs of students and employees who have disabilities. It also prohibits discrimination based on a disability. As a result of this act, many universities and employers made architectural changes in an effort to increased accessibility to individuals with disabilities. Many of these changes involved the use of some sort of assistive technology.

The rehabilitation act, which was amended in 1986, 1992, and 1993, included several provisions involving assistive technology. The amendments required that each

state included within its vocational rehabilitation plan a provision for assistive technology. This plan is the basis by which federal funding for vocational rehabilitation is designated.

Another provision of the rehabilitation act was developed to insure access to "electronic office equipment" by persons with disabilities who are employed by the federal government. This legislation, as a result, had a significant impact on the design and manufacturing of computers and thus increased their accessibility to people with disabilities (Cook & Hussey, 2002).

The American's with Disabilities Act first went into affect in 1990. The ADA covers three primary areas: employment, public services, and public accommodations (Title I-III). Two additional areas are covered including telecommunications and miscellaneous provisions (Title IV-V).

Title I: Equal Employment Opportunities for Individuals with Disabilities seeks to ensure access to equal employment based on merit of the person with the disability. It was developed to break down the barriers which may interfere with employment for people with disabilities.

Title II: Nondiscrimination on the Basis of Disability

in State and Government Services covers "Public Entities". It prohibits these entities from refusing a person with a disability from participating in a program. It also makes provisions for public agencies, i.e., public transportation to be accessible by all.

Title III: Public Accommodations and Services Operated by Private Entities prohibits discrimination against individuals with disabilities in the "full and equal" enjoyment of goods, services, facilities, privileges, advantages, or accommodations of any public place.

Title IV: Telecommunications addresses telephone and television access for people with hearing and speech disabilities. It requires that common carriers provide 24 hours a day interstate and intrastate telecommunications relay services to people who are hearing or speech impaired. The Federal Communications Commission has set minimum standards for the relay services.

Title V: Miscellaneous Provisions includes several other provisions not found in the other titles. This includes such things as attorney fees, technical assistance plans, and further defines what does or does not constitute a disability under this law (Rothstein, Roy, & Wolf , 1998, pp. 2-3).

Several federal laws impact the educational programs and services children receive. These laws address a child with a disability's education and civil rights by guaranteeing that all students receive a free and appropriate public education (FAPE). These laws have an impact on the services (including assistive technology) that a student receives.

The Individuals with Disabilities Education Act (P.L. 101-476), which was formerly known as the Education for All Handicapped Children Act (EHA, P.L. 94-142), and its amendments identify the special education and related services in order for students with disabilities to receive their FAPE. In addition, section 504 of the Rehabilitation Act of 1973 protects the right of students with disabilities who do not need special education services to have full access to all programs offered by the school. It includes the rights of students with disabilities to utilize assistive technology in the education process.

Since 1974, the EHA has guaranteed the educational opportunities for children with disabilities for ages 5-21 years of age. In 1986 this law was amended. PL 99-457 extends the rights of the FAPE to children 3-5 years of age. It also established a new voluntary state program for

providing early childhood intervention for children from birth to 2 years of age.

In 1990, further amendments were added to the EHA. This amendment replaced the phrase "handicapped child" with "child with a disability." It also changed the name of the law to the Individuals with Disabilities Education Act (IDEA) (P.L. 101-476). IDEA significantly strengthened a child's right to access assistive devices that were always a part of the free appropriate education under P.L. 94-142 which had never been identified specifically.

IDEA recognized the significant importance of assistive technology as it relates to a student's ability to gain independence in school. It specifically incorporated assistive technology terms into its wording and provided the same definitions as were stated in the federal law known as the Technology Related Assistance for Individuals with Disabilities Act of 1988 (P.L. 100-407) (Angelo, 1997, pp. 225-226).

Under the Assistive Technology Act (ATA) all states and territories are eligible to receive funding for 10 years. States that have completed 10 years in the program will have three additional years of federal funding to continue their assistive technology programs. Under Title I in the ATA,

funded states and territories are required to conduct the following activities:

1. Support a public awareness program designed to provide information related to the availability and benefits of assistive technology devices and assistive technology services.
2. Promote interagency coordination that improves access to assistive technology devices and services to all ages with disabilities.
3. Provide technical assistance and training including the development and implementation of laws, regulation, policies, practices, and procedures, or organizational structures that promote access to assistive technology devices and services.
4. Provide outreach support to statewide community based organizations that provide assistive devices or services to individual with disabilities or assist individuals in using assistive technology devices and services including focusing on individuals from under represented and rural populations.
(Angelo, 1997)

The ATA also includes Title II--National Activities and Title III--Alternative Funding Mechanisms. Title II--National Activities include coordination of federal research efforts, small business incentives, technology and universal design, outreach, training, and programs by the President's Committee on Employment of People with Disabilities. Title III--Alternative Funding Mechanisms provides for assistive technology that may include a low-interest loan fund, a revolving loan fund, an interest buy-down program, and a

guarantee of insurance program.

Medicaid is a federal and state program authorized under Title XIX of the Social Security Act of 1965. Eligibility to this program is dependent on a person's income level. This program varies from state to state. The Health Care Financing Administration (HCFA) sets general program requirements, and the states are responsible for the development and implementation of the program. The federal government matches state funding relative to the wealth of the state. This match ranges from an 80% federal match to the poorest state down to 50% for the wealthiest.

An individual can seek Medicaid funding for assistive technology but must meet three criteria. The individual must be eligible for Medicaid, the specific device must be one they can be funded by the Medicaid program, and it must be established that the device requested is medically necessary.

The Medicare program was authorized under Title XVIII of the Social Security Act of 1965. This program is administered by the federal government, and as a result, the rules are the same for every state in the nation. Medicare is another major funding source for assistive technology. In both the Medicare and Medicaid system, assistive

technology is labeled as durable medical equipment. Durable medical equipment as defined by Medicare must withstand repeated use, is primarily and customarily used to serve a medical progress, is in general not useful to a person in the absence of a disability, and must be appropriate for use in the home. Typically, if an item is used for personal comfort or everyday care, it is excluded under Medicare law (Cook & Hussey, 2002).

Rehabilitation Technologist

With an increased need for assistive technology came an increase in funding of assistive technology equipment and services and an increased need for qualified individuals to assess prescribe such equipment. Rehabilitation Engineering Society of North America developed an assistive technology certification program in an effort to help address this need. The challenge of establishing a valid and useful certification program was complicated by the great diversity of the many disciplines and involved. Those from a variety of disciplines are allowed to sit for this examination process. These disciplines include occupational therapists, physical therapists, professional engineers, speech language pathologist, and special education teachers. Sitting for the examination is on a voluntary basis. The examination

has been developed in an effort to established a set of professional competencies in the area of assistive technology as a whole (Cook & Hussey, 2002). The test has been written and implemented in an effort to determine basic competencies in assistive technology.

Like the other areas of assistive technology, seating and positioning had taken a rapid growth in the last 20 years in relationship to an increased need and an increase in legislative support. The process of evaluating individuals for seating and mobility requires much skill and knowledge and a thorough method that includes consideration of many factors. The process of delivering the services is a transdisciplinary effort involving the skills and talents of a variety of professionals (Cook & Hussey, 2002, p. 168). The occupational or physical therapists may typically take on the role of the team leader and seating and positioning specialist (Cook & Hussey, 2002, p. 26).

Seating and Mobility Specialist

A thorough seating and positioning evaluation must cover many areas. Both a needs evaluation and the skills evaluation are required. The needs evaluation looks at the specific needs of the individual regarding seating. This examines such areas as the setting in which the technology

is to be used. For example it may be determined whether the seating and mobility system will be used in the home, at school, at work, or for sports to name a few. The use of a holistic approach during this portion of the evaluation process can mean the difference for an individual being independent rather than being dependent on others for care. If, for example, an individual primarily uses the wheelchair in the home and wishes to eat meals with the rest of the family at the table, it is important that the wheelchair support this goal. If the wheelchair raises the person too high, the person's knees may hit the bottom of the table, or the armrests may hit the edge of the table thus interfering with this function.

A skills evaluation is also a necessary component of a thorough seating and mobility evaluation. Areas which should be evaluated as a part of a seating and mobility evaluation include physical skills, sensory skills, behavioral or cognitive skills, motivation level, and functional skills. Both occupational and physical therapists receive training and have a basic understanding of these areas (Cook & Hussey, 2002). This knowledge must then be applied as it relates to the seating and positioning needs of the individual.

Several sub-components make up a seating and mobility evaluation. These are the mat exam, a movement assessment, pressure mapping, and simulation of the desired equipment. The mat exam refers to the portion of the evaluation in which the rehabilitation technologist evaluates the consumer on a firm padded table that is referred to as a mat. The consumer is evaluated both in the supine position and in sitting. A number of areas can be assessed with the consumer in this position. It allows the therapist to assess the consumer without any support surfaces present and to determine the affects of gravity on posture. It also allows the therapist to observe how the consumer moves unrestricted by doing a movement assessment. During the mat assessment flexibility and range of motion of the trunk and extremities are measured (Cook & Hussey, 2002, pp. 169-171).

Pressure mapping is a tool which is used when a consumer has a history of pressure sores or is at high risk for developing pressure sores. A computer is used to measure pressure and its relationship to various parts of the body such as the tail bone and the affects different cushions will have on the prevention of pressure sores (Cook & Hussey, 2002, pp. 194-195).

Following a seating and mobility evaluation, a

simulation of the desired equipment may be utilized. This assists the technologist in the final equipment recommendation decisions. Simulation allows the technologist to see which components may help the consumer and which components may cause problems. It also allows the technologist and the consumer to determine whether the equipment will enhance or hinder function and thus to make decisions based on this objective information. Pressure mapping may also be tied into the simulation process to determine whether the best pressure relieving system has been found for the consumer (Olson & DeRuyter, 2002, p. 213).

Seating and positioning technology and the research base is constantly changing. Matching and individual's specific and individualized needs and skills to appropriate seating and mobility equipment is imperative. An appropriately fitting wheelchair can affect and individual's comfort level, postural control, and ultimately the individual's level of independence.

The importance and impact that proper seating and positioning can have on a person's life can be summarized as follows:

Joan Bergman, a physical therapist who was involved in the development of evaluation and

intervention techniques for wheelchair seating during the 1970s and 1980s stated that "positioning in life is everything." She shared this view with users and colleagues throughout the world as she demonstrated that individuals who feel "right" in their position in life use their abilities to the fullest. Positioning intervention is often the precursor to any other assistive technology intervention. The benefits of optimal positioning, illustrate the way someone's position in life can change with appropriate intervention. The ultimate goal for specialists with a provide seating intervention, therefore, should be to focus on users who have a quest to achieve optimal function, independence, and satisfaction to secure their rightful "position in life". (Olson & DeRuyter, 2002, p. 232)

Ethics

Ethical standards should not be treated as articles of containment but should be embraced as welcome and moral principles guiding a professional. Becoming a professional involves a negotiation between the person and the community. Professionals agree to provide the needed service and the community agrees to compensate them for the service and recognizes their right to perform such services (Gardner, Csikszentmihalyi, & Damon, 2001, p. 16). One element of professionalism is professional competence. Competence goes beyond developing and learning skills in a particular practice area. It should also involve sufficient allocation of resources (Shestack, 1998, p. 72). The relationship between the practitioners and the public they serve is

always in a delicate balance (Gardner, et al., 2001, pp. 16-19). Over time this built in tension can either result in a fruitful synergy or degenerate into conflict.

Realms, or areas of practice, can change as a result of four factors. First, the development of tools has helped make medicine a more rigorous practice. Similarly, the development of technology and its constant changing qualities has also made the prescription of seating and mobility products more rigorous.

Second, the context of cultural knowledge can also change a realm. People with severe physical disabilities are beginning to be seen as people and not just as a disability. Institutionalization of children and young adults with disabilities is no longer the norm. They are now involved in the community, and as a result, they need improved access through appropriate seating and mobility products.

Third, social environments and their developments are also changing. A realm must always be responsive to the demand for its services. Patterns of ownership, control, and other political shifts affect this realm. For instance, a therapist may know that one particular product may better serve an individual than another product. However, if the

therapist functions under the throes of a managed-care contract, that professional's perceived ability to recommend what is needed as opposed to what is most cost-efficient may impose ethical dilemmas.

Fourth, final source of change is innovation of individual practitioners. Creative people tend to be driven by curiosity and to be intrinsically motivated. These innovators are less concerned with the attainment of money and power, receiving satisfaction directly from the rewarding work. Typically, gifted and idealistic young people gravitate towards challenging careers. However, if a profession fails to provide intellectual challenges, its members may become less creative and tend to stagnate.

The quality of life in the future will depend on whether we find a way to do good work under these changing conditions. If the fundamentals of good work - excellence and ethics - are in harmony, we lead a personally fulfilling and socially rewarding life. If they are not, either the individual or the community, or both, will suffer. Since most people want to do work that is useful as well as meaningful one important question for us to begin with is "what can people do when conditions threaten a harmonious alignment?" (Gardner et al., 2001, p. 16)

The concept of best practices and its relationship with adult learning can introduce possible solutions to this dilemma.

Best Practices

Best practices are professional's decisions and actions which are based both on knowledge and evidence that reflect the most current and innovative ideas available (Dunn, 2000). A best practice is anything better than current practice (Keehley, Medlin, MacBride, & Longmire, 1997, p. 19). Seven criteria define best practice:

1. *Successful over time*: A best practice must have a proven track record.
2. *Quantifiable results*: The success of a best practice must be quantifiable.
3. *Innovative*: A program or practice should be recognized by its peers as being creative or innovative.
4. *Recognized positive outcome*: If quantifiable results are limited, a best practice may be recognized through other positive indicators.
5. *Repeatable*: A best practice should be replicable with modifications. It should establish a clear roadmap, describing how the practice evolved and what benefits are likely to accrue to others who adopt the practice.
6. *Has local importance*: Best practices are salient to the organization searching for improvement. The topic, program, process, or issues do not need to be identical to the importing organization, however.
7. *Not linked to unique demographics*: A best practice may have evolved as result of unique demographics, but it should be transferable, with modifications, to organizations where those demographics do not necessarily exist. (Keehley, Medlin, MacBride, & Longmire, 1997, p. 19)

"Best practice is a way of thinking about problems in imaginative ways, applying knowledge creatively to solve performance problems while also taking responsibility for

evaluating the effectiveness of the innovations to inform future practices" (Law et al., 2001, p. 9). What is best practice today typically becomes the standard of practice in the future. The rise of standards is how knowledge advances a profession. The standards of practice today were best practices of the past that have influenced and guided practice. When a practitioner continues a standard of practice across a long time period, that practice may become out of date and may not stand up to standard of practice scrutiny (Law et al. 2001, p. 9). Thus, the process of change constantly causes current practices to become outdated and requires professionals to learn about new developing best practices. Consequently, it is important for professionals to embrace the concept of real-life learning and for organizations to focus on client-centered education. Changes in technology are creating increasing demands on employees to become knowledgeable workers and problems solvers as they keep pace with the rapid changes in the marketplace (Blazey, Davison, & Evans, 2000, pp. 16-17). A thorough understanding of the adult learning process can further facilitate a professional's continued growth and contribution to the field through the utilization and continuation of best practices.

Adult Learning Principles

The overall purpose of adult education is to "assist adults to increase their competence, or negotiate transitions in their social roles...to gain fulfillment in their personal lives, and to assist them in solving personal and community problems" (Darkenwald & Merriam, 1982, p. 9). Adult education is a flexible and multifaceted endeavor and involves both the process of adult learning and the methods for teaching adults. The education of adults occurs in both formal and informal settings (Merriam & Cafarella, 1999, p. 21). Adult education principals and learning strategies apply in a variety of ways to the occupational and physical therapist striving to attain best practices. Therapists are adult learners who have a need to receive and participate in continuing education as it relates to new technology, treatment strategies, and consumer education.

Real-Life Learning

Adults often apply their learning to real-life situations (Conti & Fellenz, 1991, p. 64). Real-life learning is "relevant to the living tasks of the individual in contrast to those tasks considered more appropriate to formal education" (Fellenz & Conti, 1989, p. 3). Real-life learning stems from learner's real-life situations and is

applied to that situation.

Real-life learning is immediately applicable to adults' lives both personally and professionally. When real-life learning occurs, more attention is given to the desires of the individual learners rather than tasks proposed by formal education (Fellenz & Conti, 1989). Formal education does not generally prepare people to learn from everyday life experiences (Sternberg, 1990, p. 35). This can also hold true for physical and occupational therapists working in the specialized field of seating and mobility. The consumers vary and the technology is constantly changing. Therefore, the therapist must be adept at learning new skills and technology which will assist in meeting an individual's needs.

Many adults choose continuing education activities that are practical in nature and oriented toward a current problem in their work or home setting (Merriam & Caffarella, 1999, p. 47). The role of adult education is to assist learners in their social or professional roles and to help individuals to perform these roles better. Adult education should be an enhancement of what the learner already knows, building upon their existing knowledge base (Darkenwald & Merriam, 1982, p.77).

Knowles (1980) defined adult learning as "the art and science of helping adults learn" (p. 43). Due to the technological revolution, new knowledge is constantly being generated, and it is impossible to simply transmit the body of all known knowledge to the learner. The focus of education needs to be on enabling individuals to be self-directed in their learning and to seek knowledge as a lifelong process (p. 41).

Knowles' concept of andragogy was originally based upon four core assumptions that should serve as a guide for instructional design.

1. Concepts of the Learner: in andragogy, the learner progresses from being dependent to being self-directed and more autonomous. Individuals will differ in the rate and timing of their progression toward self-directed learning. The teachers serves to facilitate the individual's move toward autonomy and self-direction. Adults may still be dependent in some situations but have an actual psychological need to be self-directing, similar to Maslow's hierarchy that states that adults strive towards self-actualization .
2. The Role of the Learner's Experience: In andragogy, value and emphasis are placed upon the rich expanse of the learner's life experiences. Personal experience helps the learner make meaning from a learning encounter and can also serve to teach others. Content is tied to experiential activities in order to increase the meaning and practicality of the subject matter presented. Humans of all ages learn from and remember what they do, and this commonality is

- recognized.
3. Readiness to Learn: Andragogical principals state that individuals are ready to learn when a topic becomes relevant and applicable to an event in their everyday lives. Teachers serve to help learners identify what they need to know at the current time and how to apply this knowledge to their unique situations.
 4. Orientation to Learning: Andragogy states that learners want to become more competent in their fields or areas of interest. Learners seek to be able to immediately apply the knowledge they learn to their daily lives. Knowledge should not be so abstract and decontextualized as to be without practical application and personal relevancy. Problem solving and performance is stressed, and the learner seeks education in order to solve problems (Knowles, 1980, pp. 43-44)

Knowles added to his original assumptions of adult learning in his later writings. In 1984, he wrote that adults are motivated to learn by internal rather than external factors (p. 12). In 1990, Knowles added a sixth assumption stating that it is important for adults to know why they are being required to learn content information (p. 57). Adults are less likely to passively accept the necessity of learning information simply to complete a requirement if they cannot ascertain the value or relevance of the knowledge or skills.

Adults diagnose their own learning needs and their motivation to learn is maximized (Knowles, 1980, p. 227). To facilitate self-diagnosis of learning needs, one must

first determine the required competencies for the task. This can be achieved through surveying the recent literature, by using the judgment of experts in the field, by conducting a task analysis, or by allowing the group to develop their own model of the skills needed to be competent in a designated area (pp. 227-228). The understanding and development of best practices by expert practitioners in the field can help to determine what skills are needed for a thorough seating and mobility evaluation.

After skills are determined, practitioners in the field can determine their own skill level which will help them to become sensitive to their own strengths and weaknesses encouraging them to focus on their efforts towards growth. Learners must determine the gap between their current skills and the desired competency level and then take the initiative to choose their own path and formulate their goals (Knowles, 1980, pp. 230-232).

Self-directed learning is "a process in which individuals take the initiative, with or without the help of the others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing, and implementing appropriate learning strategies, and evaluating learning outcomes" (Knowles,

1980, p. 18). Adults become more self-directing and less dependent as they mature and assume the social role and responsibilities of an adult (p. 15). This is important in the concept of assuring and maintaining best practices in the field of seating and mobility. In this constantly changing field, practitioners must not be satisfied with their current skills. They must be willing to constantly assess and reassess their current skill level, seeking to improve as they utilize what is current in area of best practices as their guide.

Learning How to Learn

Learning how to learn is a key strategy in facilitating the inclusion of best practices. Learning how to learn is the process of adults acquiring the knowledge and skills essential to function effectively in various learning situations (Smith, 1976, p. 5).

Learning how to learn involves possessing, or acquiring, the knowledge and skills to learn effectively in what ever learning situation one encounters. If you possess the necessary knowledge and skill, you've learned how to learn; and when you help yourself or others to acquire that kind of knowledge or skill, the concept is also at work. (Smith, 1982, p. 19)

Three steps are involved in the process of learning how to learn. These steps include: (a) planning or establishing how adult learners identify their needs, set goals, and

select resources and strategies; (b) conducting actual learning activities in which procedures are negotiated and resources utilized as adult learners learn to give and receive feedback; and (c) evaluating how adult learners measure the extent to which their learning goals are met (Smith, 1976, p. 6).

Three key ingredients in the learning how to learn concept include: (a) determining what the learner needs to know such as general understandings, basic skills, and self-knowledge; (b) learning style or the persons highly individualized preferences and tendencies that influence learning including the fact that people differ in how they think, approach problems, and process information during learning activities; (c) training with the actual provision of the learning about learning or improving learning proficiency (Smith, 1982, p. 17). A therapist's ability to recognize and utilize these concepts can serve to enhance their skill level. Learning how to learn is an ongoing process and the importance of this skill should not be minimized. Effective learning is a requirement for enhancing one's knowledge base and skill level.

Reflective Practice

The field of seating and mobility has become highly

technical. When a therapist chooses to practice in a highly specialized field, development into a self-directed, reflective practitioner is of utmost importance.

Reflective practice occurs when professionals use "reflection on their patterns of action, on the situations in which they are performing, and on the know-how implicit in their performance" (Schon, 1983, p. 55). The ability to reflect upon previously attained knowledge, current available technology, current best practices in the field, and current consumer needs is crucial.

Through reflection, he can surface and criticize the tacit understandings that have grown up around repetitive experiences of a specialized practice, and can make sense of the situations of the uncertainty or uniqueness which he may allow himself to experience (Schon, 1983, p. 61)

This ability to critically reflect allows the therapist to look at past experiences, current skill level, current knowledge of best practices, and current resources available and to determine appropriate strategies to best meet consumers needs. Through the critical reflection process and as a therapist increases personal autonomy, it is a likely transformational learning can occur.

Transformational Learning

Ongoing professional training should have as a goal

perspective transformation for both occupational and physical therapists. Mezirow (1990) defines perspective transformation in adult learning as:

The process of becoming critically aware of how and why our presuppositions have come to constrain the way we perceive, understand, and feel about our world; a brief formulating these assumptions to permit a more inclusive, discriminating, permeable, and integrative perspective; and of making decisions or otherwise acting upon these new understandings. (p. 14)

Transformational learning is composed of three tenets:

(a) critically reflecting on one's assumptions, (b) experiencing insight into the reason for these assumptions, and (c) then taking some type of action upon these insights (Mezirow, 1990, p. 354). Transformational learning is different from everyday learning because it produces far-reaching changes in individuals and actually shapes them, their future behaviors, and their attitudes (p. 2).

Dewey described reflective thinking as critical and questioning, such as when encountering an event or issue that creates a state of doubt (Dewey, 1933, p. 12). Such thinking is a deep level of thought and not just a transient sensation or impression. Dewey's definition of reflective thinking is similar to Mezirow's work on perspective transformation, and it stresses the importance of examining one's belief systems and the presuppositions that affect

attitudes and actions. Dewey (1933) further stated that individuals need to have the personal and mental attitudes of open-mindedness, responsibility, and whole-heartedness in order to engage in reflective thought.

Transformational learning occurs when critical reflection is followed by insight into the reason behind one's values, and the individual then determines whether to reject or modify these beliefs. According to Mezirow (1990), individuals have unique meaning systems consisting of beliefs, values, and assumptions. These meaning systems serve to filter and interpret new experiences so individuals can relate to them and understand them. However, one's personal meaning systems can also distort perceptions according to preconceived expectations (p. 2).

It can be hypothesized that critical reflection and transformational learning are directly tied to the development of best practices, professionalism, and high ethical standards. Adults need to be able to actively think about why they make certain assumptions and judgments, and adult education helps learners assume responsibility for decision-making. Adult education through critical reflection enables learner to ask such questions as why do I think the way I do? What are the presuppositions that I

bring to this experience? Adult education and the use of critical reflection allows the learner to process through the questions and to answer questions reflectively (Mezirow, 1990).

CHAPTER 3
METHODOLOGY

Design

This study utilized a descriptive research design. Descriptive research involves the collection of data to answer questions concerning a specific subject. "A descriptive study determines and reports the way things are" (Gay, 1996, p. 249). Descriptive data are typically collected through questionnaires, interviews, and observations. The development of the Internet has provided an additional way to collect this data. Descriptive research is not typically utilized to test a researcher's hypothesis. In descriptive research, the researcher usually does not assign participants to different groups or control independent variables. Descriptive studies are intended to present new information and to ask questions in order to better understand a subject (Portney & Watkins, 1993, p. 233). Descriptive research design asks questions that are future oriented and have not been asked before (Gay, 1992).

Descriptive research may be quantitative or qualitative in nature. This study is qualitative and can be classified as naturalistic inquiry. Guba (1978), who wrote the seminal work in this area, defines naturalistic inquiry as follows:

Naturalistic inquiry (N/I) is an alternative mode of inquiry which differs from other modes by its relative position along two dimensions: (a) the degree of manipulation of conditions antecedent to the inquiry, and (b) the degree of constraint imposed on outputs by subjects involved in the inquiry. It also differs from other modes with respect to its basic assumptions or characteristics. (p. 3)

Naturalistic inquiry is a fluid, subjective approach to research. The purpose is for naturalistic inquiry, discovery, description, understanding, and interpretation within a specific area. It takes place in the natural setting and seeks to describe a phenomena. The researcher is the primary data collection instrument, and personal involvement of the researcher is expected (Lively, 2001, p. 27).

This descriptive study focused on the best practices of occupational and physical therapists in the field of assistive technology who specialize in wheelchair evaluations. The snowball sampling technique was utilized to identify 15 individuals who qualify as experts in the field of assistive technology, according to the researcher's criteria. A personal contact was made with these potential participants to identify their interest in participating in the study. Those who agreed to participate were sent an electronic, open-ended questionnaire which also included

demographic information.

Delphi Technique

A Historical Perspective

The Delphi technique is the research method that was utilized to gather data to determine best practices by occupational and physical therapists performing wheelchair assessments. This technique, which was developed by Dalkey and Helmer at the Rand Corporation in the 1950s, is a data collection method that is designed to structure group opinion and discussion. Shortly after its development, it fell out of favor as people misused it by "stacking the deck" with experts who saw their way. For this study, the views and opinions of the participants were not known by the researcher.

Historically, the technique has been applied in a variety of ways to assess the judgments of experts (Halpern, Thompson, & Schaffer, 2000). It is commonly used to measure the judgments of this group of experts to identify priorities without the experts needing to meet together (Pulcini, 2002). Beginning in the mid 1970s, increased use of this technique was noted in health-care research studies that focused on research priority identification, curriculum development, healthcare standards and policy development,

and assessment of healthcare setting innovation readiness. In the mid-1990s an increased use of the Delphi technique was observed in studies conducted to identify priorities and needs associated with clinical IT/computer innovation (Halpern et al, 2000).

A series of experiments conducted by Dalkey discovered that when anonymous and controlled feedback was provided to members of the decision-making group, more accurate decisions were produced than when such groups reached decisions by face-to-face discussions (Dalkey & Helmer, 1962). The strength of expert opinion when used in a Delphi study was summed up by Weaver (1971) as follows:

In effect, the Delphi studies operate on the principle that several heads are better than one in making subjective conjectures about the future, and that experts, within a controlled intuitive process, will make conjectures based upon rational judgment and shared information rather than merely guessing, and will separate hope from likelihood in the process. (p. 269)

The Delphi methodology allows the collection of opinions from geographically dispersed experts possible. This methodology also produces more accurate group estimates as compared to face-to-face discussions because it reduces the influence of certain psychological factors such as peer persuasion, the unwillingness to abandon publicly expressed opinion, and the Delphi technique is a useful tool for the

collection of information and expert opinion.

The Process

The Delphi technique is distinguished from other group data collection processes in three ways: (1) anonymity, (2) interaction with controlled feedback, and (3) statistical group response (Halpern et al., 2000). The following summarizes how the Delphi technique is typically administered. A panel of experts on the topic of interest is recruited. Each panel expert is then asked to independently respond to question designed to elicit opinions, estimates, or predictions regarding the topic. The typical first-round questionnaire uses an open-ended format to elicit individual judgments or opinions from each member of the expert panel about the particular issue or problem under study. In essence, round one amounts to an anonymous brainstorming session. It is utilized in situations which do not lend themselves to precise analytic solutions or when a problem requires the contribution of thoughts of groups whose members cannot meet effectively face-to-face.

Panel responses are aggregated, tabulated, summarized, and return to the experts in a series of data collection rounds. Using the aggregated responses of all panel experts from the preceding round, each expert again predicts,

comments, and responds to the information in the new round, which is subsequently returned to the investigator for analysis. This process is repeated until final data reflect a consensus of opinions, predictions, or beliefs among all of the panel experts (Halpern et al., 2000).

Defining Expert

The Delphi method is conducive to much independent thought on the part of the experts. Its use of controlled interaction among respondents represents a deliberate attempt to avoid the disadvantages associated with the conventional use of experts such as round table discussions or other forms of possible confrontation with more opposing views. Direct confrontation all too often induces the hasty formulation of preconceived notions, an inclination to close one's mind to novel idea, a tendency to defend a stand once taken, or a predisposition to be swayed by the opinions of others (Dalkey & Helmer, 1962).

To effectively participate in the Delphi study, a person needs to be an expert in the area under study. The term "expert" and how it is used has been the subject of controversy. The dictionary defines such a person as "experienced; having, involving, or displaying special skill or knowledge derived from training or experience"

(Webster's, 1990, p. 437). Three ways that experts are distinguished from lay people are:

1. Experts are persons who have sufficient knowledge and experience to have mastered the advanced skills of a particular domain of knowledge or experience.
2. Not only do experts have a special skill, they are proficient in their actions and they have special ways of applying their knowledge to a task in their area of expertise.
3. Experts are also proficient at identifying problems in their areas and then being able to tell if the problems are solvable. When the problems are solvable, the experts then solve them. (Walton, 1992)

Currently, there is not an association within the field of occupational therapy or physical therapy which limits its membership on the basis of expert knowledge level. The Rehabilitation Engineering Society of North America (RESNA) opens its membership to all practitioners interested in the area of assistive technology regardless of their skill level. Credentialing is available however, it is generalized to all areas of assistive technology.

A physical or occupational therapist can be credentialed as an Assistive Technology Practitioner. This credentialing promotes an entry level of expertise in the field of assistive technology (RESNA, 1998). An occupational or physical therapist is eligible to sit for

the credentialing examination with a minimum of 25% full-time equivalent in assistive technology of direct consumer related services for a minimum of 2 years. These criteria are considerably less than those established as "expert criteria" and are promoted as an entry level of expertise in the field of assistive technology as a whole, not specifically seating and mobility (RESNA, 1998).

The expert practitioner had to be well defined and identified for this study. Subject selection criteria on expertise has been developed to identify potential experts (Jensen, Gwyer, Shepard, & Hack, 2000, pp. 28-43). Expert criteria includes: having seven or more years of clinical practice, being involved in direct patient care at least 50% of the time, having completed formal or informal advanced work in the specialty area, and being someone to whom the nominator would refer a patient with complications or a family member for care. These criteria served as the baseline criteria for this study. Five experts were initially identified by this researcher who met or exceeded these criteria. They in turn were asked to identify five other experts in the field according to these criteria.

Sample

A population is an entire group that has a similar set

of characteristics. The defined population must have at least one characteristic that differentiates it from other groups (Gay, 1992, p. 125). While it is generally not feasible, or even necessary, to include all members of a population, it is imperative that the sample, or the individuals actually involved in the research, be representative of the larger population (Gay, 1992, p. 124). The population for this study was comprised of expert occupational and physical therapists who have experience in the field of assistive technology. Experts in the field were identified by the researcher and confirmed by another leader in the field.

A sample is a subset of the population to which the researcher intends to generalize the results (Gay, 1992, p. 124). A good sample is one that is truly representative of the population from which it is selected.

Regardless of the specific sampling method used, "the steps of sampling are essentially the same: identification of the population, determination of the acquired sample size, and selection of the sample" (Gay, 1992, p. 126). The two basic types of sampling are probability and non-probability. Random sampling is an example of probability sampling. It allows the researcher to generalize the results

of the study from the sample to the population from which it is drawn (Merriam, 1998, p. 60). On the other hand, non-probability sampling methods are appropriate for solving "qualitative problems, such as discovering what occurs, the implications of what occurs, and the relationships linking occurrences" (p. 61). Purposeful sampling is the most common form of non-probabilistic sampling.

Purposeful sampling is based on the assumption that the investigator wants to discover, understand, and gain insight and therefore must select a sample from which the most can be learned....The situation is analogous to one in which a number of expert consultants are called in on a difficult medical case. These consultants--also a purposive sample--are not called in to get an average opinion that would correspond to the average opinion of the entire medical profession. They are called in precisely because of their special experience and competence. (Merriam, 1998, p. 61)

Selection criteria for participants which has been utilized in previous work on expert practice were utilized to identify potential experts. The therapists for this study met the following criteria: (a) have 7 or more years of clinical practice, (b) be involved in direct patient care at least 50% of the time, and (c) have completed formal or informal advanced work in the specialty area of assistive technology (Jensen, Gwyer, Shepard, & Hack, 2000). The researcher utilized the snowball sampling technique (Bogdan

& Biklen, 1982, pp. 66-67) to identify five experts in the field who met the criteria. In this technique, individual participants were each asked to identify several other qualified individuals who might be interested in participating in the study. Thus, a larger sampling of expert participants was identified.

A total of 15 experts comprised the sample for this study (see Table 1). The expert panel exceeded the defined criteria for an expert. Experience of the panel ranged from 10 through 33.5 years with the average 18.4 years. One-third of the participants were occupational therapists (OTR), and two-thirds of the participants were physical therapists (PT). The participants were geographically diverse and were from 12 states throughout the United States.

Questionnaire Development

"Qualitative interviewing is not only a tool of research but is also an approach to learning and a philosophy. Encouraging individuals to describe their world in their own terms is one element of this philosophy" (Self, 2000, p. 48). Open-ended questionnaires are frequently used as a tool when face-to-face interviews are not feasible to capture the voices of people as they describe their

Table 1: Distribution of Expert Panel

Profession	Residence	Years in profession
PT	Florida	33.5
OTR	Illinois	24
PT	Massachusetts	23
OTR	Louisiana	23
PT	North Carolina	21
PT	New York	19
PT	Atlanta	19
PT	Oklahoma	18
OTR	Colorado	18
PT	Pennsylvania	17
OTR	Pennsylvania	14
PT	Colorado	14
PT	Pennsylvania	13
OTR	New York	10
PT	Washington	10

perspectives of the worlds in which they live and work. Designing well-thought out questionnaires is critical to the credibility of the data collected (Geib, 2002). The questions must be composed of open-ended questions that ensure essential exploratory and unstructured responses can be forthcoming (Osgood, 1999, p. 63).

A focus group was held during the 2002 international seating symposium in Vancouver Canada for this study.

Participants of the conference were invited to attend the focus group through a written invitation. The outcome of this group process produced several concerns. From this data the questionnaire framework was developed. In Round 1, a 7-item questionnaire of open-ended questions was developed. The responses to the questionnaire formed the basis for the development of the 8-item questionnaire in Round 2. All Round 2 questions were based on the data gathered in Round 1 and were utilized to inform the expert panel of the overall outcomes of Round 1 and to attain further clarification and consensus. The format of the questions included open ended questions, ranking and rating questions, and yes or no responses.

Validity broadly defined refers to the degree in which something measures what it is supposed to measure. Content validity refers to the degree or ability of a test to measure a particular content area. Construct validity refers to the credibility of a test's constructs. Validity is often determined by expert judgement (Gay, 1987, pp. 128-132). A small group comprised of individuals who have experience in assistive technology or research were asked to evaluate the questionnaire for content and construct validity in three areas: (1) to determine if the questions

collectively covered the material that the instrument was designed to collect, (2) to determine the clarity of the questions, and (3) to determine that the e-mail versions of the survey was user friendly and free from errors. This step in the process served to ensure that the questions were clearly worded and would solicit the information intended for this study while minimizing the potential for researcher bias. Changes recommended by the group were incorporated into the questionnaire.

Content Analysis

The data that was gathered through the Delphi technique was subjected to content analysis. The content analysis method works with written or spoken words to find patterns of communication (Gay, 1987, p. 207). It is an objective, systematic, and general description of the overall content of a text. The content of the text must be emphasized and the beliefs and values of the researcher should not influence the results. Some kind of reliability test can be undertaken so that another researcher can obtain the same result from the same rules and data (Lincoln & Guba, 1985, P. 337).

Holsti (1969) describes the relationship of naturalistic data processing to the more conventional

content-analysis methods. Holsti, outlines five major characteristics of content analysis (cited in Lincoln & Guba, 1985, pp. 337-339). First it is a process that is implemented on the basis of formulated rules and procedures which are formulated before the analysis is taken. While the naturalist researcher conforms to the spirit of this requirement, the rules are flexible and are not finalized until the end of the data research analysis. This flexibility is conducive to the characteristic of qualitative research that the study drives the design rather than the design driving the research. A self-corrective design helps to ensure the credibility and the accuracy of the research (Rubin & Rubin, 1995, p. 92).

Holsti (1969) next describes content analysis as a systematic process. He defines this process as conforming to certain general category construction such that the inclusion or exclusion is done according to rules which are consistently applied to the study. This systematic rule can be met under the ex-post facto rule described above if in the end all of the data have been processed according to the same set of rules.

The third characteristic of content analysis is typically rejected within the naturalist theory. This

theory states that content analysis should permit generalization from the analyzed text to some theoretical model. However, the naturalist typically operates without such a model because the study itself is the driving factor as opposed to the theory.

Fourth, Holsti suggests that content analysis looks significantly at content. This characteristic is also objectionable. First, content analysis is often guided by the symbolic meaning of texts (Krippendorff, 1980, p. 22). This does not take into account one of the most important concepts from a naturalistic perspective, the necessity for taking context into account.

Finally, data and analysis must progress by approximate answers, since its knowledge of what the problem really is will at best be approximate (Holsti, 1969, p. 12). Thus, while utilizing certain parts of conventional content analysis, the naturalistic data processor, departs from the theory in several important ways, including the timing of rule formulation, the need for guided theory, the need to generalize findings, and the rejection of constraints to the quantitative arena. Thus, the naturalistic data process may be guided by, but should not be constrained by the conventional modes of content analysis.

The object of qualitative content analysis can be varied (Mayring, 2000). It may include recorded information, transcripts of interviews, video tapes, or the responses of a panel of experts who have been asked open ended questions. Traditionally, the researcher splits documents into small units and uses statistical procedures to test the data. Such traditional methods limit the ability of both quantitative and qualitative content analysis to answer open-ended questions. Such a limitation can be problematic for content analysis in its pure form. To overcome such difficulty, content analysis can be utilized inside a naturalistic inquiry framework (Forrest, 2002, p. 33).

Content analysis is a type of descriptive research. It looks beyond the denotation of words and attempts to understand linguistic connotations (Weber, 1990, p. 12). It is truly a unique method as it studies humans, their beliefs, and their actions exclusively through symbolic analysis of non-human data sources (Mayring, 2000). All human viewpoints regarding a topic are mediated by some form of recording either written or electronic. The researcher then uses the recording as the basis for analysis (Forrest, 2002, p. 34). In terms of this study, the internet was

utilized as a tool for data collection, thus minimizing researcher bias during the data collection period.

There are four basic qualities of content analysis regardless of the subject or procedures of the study (Krippendorff, 1980, & Weber, 1990). First, the research must take into account the context that affected or shaped the materials' creation (Krippendorff, 1980, pp. 35-38). Context refers to the environment. Environmental factors can affect the creator of the document and thus the outcomes of the research. These environmental factors are global. They can range from more personal factors such as the place a person works or lives to the broader factors such as political situations at the time. In content analysis, the belief is that the researcher is better able to draw valid conclusions if an understanding of the context in which the research takes place is recognized.

Second, content analysis unit sizes the material to be analyzed. "Unitizing involves defining... units, separating them along their boundaries, and identifying them for subsequent analysis" (Krippendorff, 1980, P. 57). These units actually become the data which is utilized in the research process. While it may appear to be one of the most basic steps, the separation process is one of the most

fundamental steps in the process (Weber, 1999, pp. 21-22). This step divides the materials into manageable units. A number of methods can be utilized for this process such as breaking the materials into paragraphs, themes, sentences, or words.

Closely related to these units is the third characteristic of categorization. In this process, meaningful and proper categories are formed and used. This is a two-step process. First, categories are formulated by either interactive or deductible logic or by using both methods (Weber, 1999, p. 23). The units are placed into categories according to the researcher's developed codes. During this process, the researcher must shape the coding system to assure that the categories do fit the data. If they do not, the categories or the codes are revised as needed.

The last quality of content analysis is related to standards. Content analysis must demonstrate high validity and reliability. Validity is the quality that allows an observer to accept the facts presented as indisputable (Weber, 1990, pp. 19-21). Reliability may be defined as the nature of truth behind the facts presented (Andren, 1981, p. 49). This is typically found and expressed quantitatively.

While no set criteria exists to judge reliability, the .80 level of agreement is suggested (Krippendorff, 1980, p. 146).

As with many other research methods, two types of content analysis exist. The older of the two, quantitative, draws from the positivist philosophical school and seeks empirical data to confirm existing theories and predict new events (Merriam, 1998, p. 9). The newer form of content analysis is qualitative. It differs from the older quantitative methods in a number of ways. At the simplest level, qualitative research strives to describe and understand rather than to prove. Some primary characteristics are its flexibility, emerging design, the use of much smaller samples, and the use of the researcher as the primary instrument for inquiry. Philosophically, qualitative research tends to be more holistic and comprehensive in nature than quantitative research (Gay, 1996, pp. 214-215). While many versions of content analysis exist, all types of content analysis have the advantage of being highly adaptable (Krippendorff, 1980, p. 30). Qualitative content analysis can be very adaptable, even to the extent that it can be combined with other research procedures if so demanded by the research questions

(Mayring, 2000). It is its adaptability and holistic qualities that made it appealing for this research project.

Data Collection

Electronic survey researcher via the Internet has many advantages over traditional paper questionnaires and interview formats. While the use of online survey research is relatively new, "the possible use of computer-mediated communication as an opinion research tool, especially using predictive data gathering techniques such as the Delphi has been documented as early as 1978" (Hefflich & Rice, 1999). Particularly in Delphi research, the advantages of online research far outweigh the disadvantages. Thus, an online research questionnaire was utilized for this study.

The Internet offers another medium over which research can be conducted. The use of online research provides of researcher with numerous benefits. When compared to traditional data collection techniques, it is cheaper and faster to administer, easier to edit, has a higher response rate, may have more candid answers, and has a potentially quicker response time with a wider area of coverage (Heflich & Rice, 1999). The use of the Internet compliments the Delphi process. It provides a method for convenient, unbiased data collection. This convenience allows the

participant to respond with a minimal inconvenience and as a result a greater amount of data may be collected.

One of the concerns in the use of electronic research is a lack of personal interaction with the participants. In order to address this concern, each participant in this study was personally contacted on the telephone. Another concern with research which involves a small sample is participant "buy in". Personal contact with all participants helped to minimize this concern. This personal contact was utilized to provide a personal touch for completion of the study while utilizing electronic media for objectivity.

Data Analysis

Surveys were sent out to the participants as an e-mail attachment which they could reply to and then return to the researcher. Qualitative data was collected through the responses to the open-ended questions, and quantitative data was collected through responses to the questions regarding the demographic information. Responses were then downloaded to a data management file. Quantitative data was transferred to SPSS for analysis, and qualitative data was transferred to a word processing program for analysis.

One of the greatest difficulties with qualitative

research is to make sense of the descriptive information compiled during the data collection stage of the research. The data was organized, tabled, and coded so that an objective, systematic and general description of the overall text was obtained.

Coding is one method which can be utilized to organize and give meaning to the information gathered and analyzed throughout the study. Responses to the open-ended questions were copied and placed into a table format using word processing software and a spread sheet format. A column was inserted in front of these responses to allow space for each response to be coded. An additional column was added such that thoughts could be added ensuring that valuable information would not be lost. The codes were then clustered according to themes. This information was then analyzed to answer the question "so what?"

With this data analysis method, all information was transferred from document to document electronically thus eliminating the need for physical transcription by the researcher. This was of great value both in a savings of time and by eliminating researcher bias that occasionally occurs during transcription. Also, the integrity and trustworthiness of the data was ensured (Geib, 2002).

CHAPTER 4
ROUND 1 FINDINGS

Introduction

To investigate the perceptions of occupational and physical therapists who specialize in wheelchair seating and mobility evaluations about their concept of best practices in the field, the members of the panel of expert practitioners were asked several open-ended questions. They were asked to describe: (a) a time when they had to solve a difficult seating and positioning problem and what skills and knowledge they utilized to solve the problem, (b) a time when a client evaluation did not go well and what they would have done differently, (c) how they differ in their early years as a seating and mobility therapist compared to now, (d) the methods used to gain their skills and knowledge to be successful, (e) barriers or potential barriers that may prevent them from completing a thorough seating and mobility of evaluation, (f) changes in the field, (g) knowledge or skills which general practitioners might be missing to perform these evaluations, and (h) what the most important thing that interacting with clients has taught them. The members of the panel, who represented leaders in the field of seating and mobility across the nation, answered these

questions with a passion and zeal.

Three overall themes emerged from the responses of these expert clinicians. The concepts that repeated themselves and were evident throughout the patterns in the data were that experience, knowledge, and sensitivity to consumers needs are all important elements of a thorough seating and mobility evaluation. These three concepts, experience, knowledge and sensitivity to consumer's needs were present in 15 or 100% of the participant's questionnaire responses.

Experience

The need for experience repeated itself throughout the expert responses.

After 30 plus years in practice this (the skills or tools used to evaluate a difficult client) is so intuitive it is difficult to describe. I have embedded all my clinical knowledge as a treating therapist into my being. Ears to listen to comments from clients and care-givers and other team members (info on present equipment, spoken and unspoken goals for new equipment) and to listen to client respirations and auditory quality and breath support. Eyes to observe client in present equipment, observe posture and fit, movement, function for transfers, pushing, etc. Eyes to observe care-giver interface, transfers, etc. Touch to do physical evaluation of the client in their existing equipment, supine, and sitting on the mat, and up on the simulator. (Physical Therapist and leader in the field of seating and positioning for over 30 years)

John Dewey (1938) said that "all genuine education

comes about through experience" (p. 13). Those who know a great deal about what they are doing or experiencing are defined as experts, and those who have only basic knowledge are termed novice. One of the most fundamental differences between experts and novices is that experts bring more knowledge or experience to solving the problem and are therefore more efficient. In addition, experts are able to solve problems faster and in a more economical way, have stronger self-monitoring skills, and are able to view and solve problems at a deeper level than novices (Ferry & Ross-Gordon, 1998; Sternberg, 1995; Tennant & Pogson, 1995).

The experts identified in this study reinforced this definition of experience and identified experience as a key component to a successful seating and mobility evaluation throughout their responses. Experience was identified as a primary tool for solving a difficult seating and positioning problem. Lack of experience and knowledge was identified as a primary cause of poor results produced by a seating and mobility evaluation. Not only was experience identified as a key component of the ability to perform a thorough seating and mobility evaluation, that experience in several identified areas was noted. Experience with various populations and a variety of diagnoses, experience with the

different types of equipment available and how they can be modified or created, experience with the consumers and knowing what questions to ask, experience with the mat assessment, experience with different positions and the affects that one thing can have on another, and experience looking at things both bio-mechanically, and functionally were all identified. In addition, many of the skills identified by the panel were "hands on" skills. Although many of the skills can be read about in a textbook, they are not truly learned until they are practiced.

I use my own hands and other body parts to conduct a "hand simulation" of the potential external supports that might be needed. I spend a lot of time in this phase to try and determine with the client what is their personal posture. (Physical Therapist, independent consultant with over 19 years in the profession)

Knowledge and experience from previous cases is utilized and applied to current cases. Over half of the participants identified the need to perform a thorough mat examination, a complete interview, simulate desired equipment, and understand current equipment available as indicators of a thorough seating and mobility evaluation. Experience has allowed these clinical experts to fine-tune and continually improve on these skills. At least one-third of the participants also identified a knowledge of bio-

mechanics more specifically in the seated posture as necessary knowledge which leads to a successful evaluation. Although bio-mechanics is typically taught in occupational and physical therapy programs, it is not taught in relation to the seated posture, and experience with consumers in the seated posture has helped this group of therapists to gain this skill. Other necessary skills also identified included pressure mapping, observation, home evaluations, problem-solving skills, funding knowledge, common sense, and knowledge of the team process.

Numerous adult educators have recognized and expanded on the fundamental role that experience plays in learning in adulthood. The connections between learning and experience all flow from the work of Dewey (1938), Kolb (1984), and Jarvis (1987). Central to all of these writers is the concept that learning from experience involves a person connecting what they have learned from current experiences to those in the past and to possible future situations. Learning from experience allows the learner make judgements and decisions based on experience (Merriam, S. B., Caffarella, S. C., 1999, pp. 221-247). This group of expert clinicians took advantage of their experiences and learned from them. What they identified to have learned the most

from experience was the improved ability to listen to their client's needs.

I spend more time listening to the client and really getting an in-depth history of what they have tried and what did or did not work in the past for them. I also spend more time really finding out what they do in their daily activities and how their wheelchair and seating influences their abilities to do the things they want to do. I also used pressure mapping (which was not available to me earlier) and a seating simulator more often as tools to help me in my assessment and decision-making process. (Physical Therapist and researcher, over 13 years in the profession)

Knowledge and Experience

Over time these therapists also recognize that they have increased their knowledge of the technology. Knowledge of what works and does not work, what breaks, and what withstands constant use and abuse. They recognize that they need to try products before recommending them. This assures that the consumer receives a reliable useable product. To further save costs and assure that the product is useable, experience has allowed them to streamline the evaluation process and to make recommendations based on evidence. The experts in this study recognize that this experience and knowledge has equipped them with the ability to complete a thorough seating and mobility evaluation and as a result they recommend products for the consumers that work. This experience was not gained overnight and required a

considerable amount of work on their part. They have utilized a variety of techniques and opportunities to gain this knowledge and experience.

I have always loved seating and mobility so I invested in my own professional development to attend conferences and courses. I have been very fortunate to have mentors--therapists, engineers, and consumers. I became comfortable enough to critique my own work and be honest enough to say when things really were not working. I found by signing up to teach and in-service, then workshops, when I had to teach someone else I learned a whole lot myself. Questions from the audience that I could not answer often lead to a new level of inquiry. I learned to check my ego at the door--so I could be open and listen to the "key issues"--keep your eye on the key issue and refer back when moving through the process--are we moving closer to the solution or further away?
(Physical Therapist, leader in the field for over 16 years)

Although experience has been the primary method identified by this group of experts in which the knowledge and skills were attained for the completion of a thorough seating and mobility assessment, the need for ongoing education was also evident by the participant's responses. Continuing education courses were the primary method identified for gaining new skills and knowledge. Some of the therapists indicated that they would take a course and then work with another therapist to further explore and expand on those things learned in formal training. The therapists were able to take the basics which they were

already familiar with and expand on them through continuing education opportunities. Although the majority of the participants indicated that continuing education courses were their primary methods for gaining new skills, other methods were also identified.

Over half the participants indicated that peer mentoring was another method they utilize for gaining skills and knowledge. The key to the utilization of a mentor is in the selection of that person. A superior mentor could be another therapist, a rehabilitation engineer or even a consumer. All of these individuals have the potential to provide superior mentoring.

Right behind this method were trade shows with one-third of the participants acknowledging this method. Trade shows provide the learner the opportunity to look at a variety of equipment options. They can compare and contrast equipment options and make decisions based on knowledge and education versus a salesman's word. Also identified by three or less of the participants were reading, risk-taking, listening, teaching, evidence-based research, focus groups, and learning from suppliers and consumers.

Follow-Up

These experts recognized the need for determining

whether recommendations which they were responsible for were successful or not. They identified follow-up, both formal and informal, as a tool which they utilize to make this determination. The term follow-up refers to activities that occur during the period immediately following delivery of an assistive technology system and that address the effectiveness of the device, training, and end-user strategies (Cook & Hussey, 2002, p. 116). Regularly scheduled follow-up is an important aspect in the delivery of assistive technology as it helps to determine whether a system does or does not work for the consumer. Mortola, Kohn, and Leblanc (1992) found in a follow-up study that 63% of 196 assistive devices delivered by their center were not being used due to mechanical reasons. In most of these cases the consumer had not informed the professional of the device failure (Cook & Hussey, 2002). The follow-up described by this panel of experts typically demonstrated a measure of success.

The client reported it worked; the support staff reported it worked, I observed it working. The client returns to make changes as the needs arise. (Physical Therapist with over 18 years of experience in assistive technology)

Barriers

The participants were also asked to identify barriers which interfere or have the potential to interfere with

their performance. A barrier is defined as something that hinders or restricts (Webster, 1995). Potential barriers which might exist have the potential to limit the therapists in a number of ways and thus interfere with their ability to perform a thorough seating and mobility evaluation. Thus, it was important to identify these potential barriers. Time, followed by funding, the unavailability of equipment, the unavailability to the consumer's home environment for assessment of wheelchair accessibility, and competition by rehabilitation suppliers were the most frequently identified barriers. The lack of time interferes the most with the evaluation process. A comprehensive evaluation may require several hours to complete. However the funding source may allow only a limited amount of time. This identified barrier seems to be dependent on the environment in which the therapist works and whether the therapist works in an environment in which time must be accounted for or whether the therapist works in an environment where the quality of the assessment is more important than the number of clients seen per day.

The identification of the other barriers tended to be very dependent upon a number of factors. These factors included geographic location, facility base, and funding

source. Although the majority of the clinicians identified lack of time as a barrier, one clinician indicated this was not a barrier because she worked in a long-term care facility. Also, many times one barrier affected another. For example, funding restraints often limited the amount of time allowed for an evaluation. Regardless of the details, the barriers identified were a concern to this group of clinicians and the clinicians did express a need to have these barriers identified and addressed

Technology

The field of assistive technology is in a constant state of change. Yet, some of the basic skills learned by most therapists as much as 10 to 20 years ago have remained the same. One of the participants pointed out, "The more things change the more they stay the same". Thus it is important to identify what skills people in the field may already possess, what skills they may need, and what resources will be available in order for them to gain the needed skills. A number of areas were identified as types of knowledge and skills that the participants think people in the field will need in the next 5 years. A nice balance of both "the old" and "the new" were identified. Critical

thinking is an important method identified for applying skills and knowledge.

The majority of the participants believed that it is important for therapists wishing to participate in seating and mobility evaluations to go "back to the basics". Basic skills identified included mat examinations, simulations, and the ability to carry out product trials. Also identified by many of the therapists was a need to have appropriate knowledge of technology in general. Such technology included computer-aided design or computer-aided manufacturing (CAD/CAM) computer skills, the ability to document on the computer and utilize the Internet, and the ability to utilize computerized equipment for seating and mobility, such as the use of pressure mapping. Other areas of technology identified included the ability to utilize remote observations (tela-health) to maximize time to gather any essential environmental information. The specific technology as it relates to the wheelchairs and seating systems is also constantly changing. Therapists need to stay up to date on this knowledge such that they can provide current, objective information to the consumers such that the consumers can make an educated decision based on their needs.

In relation to "the new" and the ability to "interface the new technology with the old", critical- thinking and problem-solving skills were identified as important means to the end. It is important that therapists remain up-to-date on new equipment available and be able to assess this equipment to determine its appropriateness.

The explosion of technology is making it harder for even skilled clinicians to compare devices and get factual information on advantages and disadvantages. There will always be a need to educate new therapists in the basic area of seating and mobility. (Physical Therapist and Seating Clinic Coordinator with over 19 years in the profession)

With the economic downturn and the tighter restrictions on durable medical equipment, the ability to secure funding is one skill in which therapists and patients will need to continue to develop. Access to research outcomes will become even more valuable as therapists will need to access the information on clinical outcomes of seating and positioning equipment.

General practitioners continue to be asked to complete seating and mobility evaluations. Although a variety of the issues and concerns were expressed by the experts in relation to this, they consistently and clearly expressed a concern that general practitioners lack experience and knowledge in the area of seating and mobility.

General practitioner physicians are not asked to do neurosurgery so why are therapists who now are not experienced doing seating and evaluations?
(Physical Therapist and leader in the field for over 33 years)

Although the general practitioner knows bio-mechanics, too many treating therapist do not know the bio-mechanics of the seated posture or the intrinsic and extrinsic factors which affect postural stability and function. Experience and knowledge of products is needed to match consumer needs with products. As a result of this limited knowledge, inexperienced therapist often jump too quickly to products rather than figuring out what works best for the consumer.

Many of the skills and knowledge needed to perform seating and mobility evaluations are extensions of basic practice skills (range of motion, manual muscle test, posture assessment, and balance assessment) but the general practitioner does not have the experience required to apply this basic knowledge to the seating environment. It is also nearly impossible for the general practitioner to be able to keep abreast of technology development and equipment that is available. In addition to these problems this type of practitioner is even more time constrained than a specialist in seating and has a schedule that is so structured that they do not even have an hour or an hour and half to spend on a seating evaluation. In addition, they have very little experience with documentation needs for seating and mobility equipment or with other funding requirements. They also do not have any skills with using specialized tools for seating evaluations, such as seating simulators, pressure mapping systems or other equipment specifically developed for the practice of seating. (Physical Therapist, seating and positioning specialist and researcher with over 13

years of experience)

One of the experts has also had the opportunity to review insurance/funding requests submitted in 17 states. She has found that the general therapists do not have a thorough knowledge of the equipment available, and although they may be able to identify some of the patient's goals, they do not have a concept of the spectrum of equipment that is available nor the hierarchy of equipment options.

The Consumer

The procurement of the equipment is not the only challenge faced by general practitioners. Once the equipment is obtained, the consumer must be trained in the use of the equipment. Many times the general practicing therapist is lacking in this knowledge of how to adequately teach the client how to properly use the equipment. The results of such inadequate knowledge can be devastating. The victim of this scenario is the consumer.

The majority of general practitioners have not had any training or education with seating and mobility evaluations and interventions. Therefore, they don't even know where to start, let alone what to do to best meet the needs of the client. What is often missing is the general premise that POSTURE is the cornerstone for optimal positioning and mobility. It is critical to be able to evaluate the position and relative mobility of the pelvis, not only by itself but also relative to the body segments above and below it. Once seated posture is optimized, then

mobility training including all functional skills can be addressed. Too often, patients are asked to practice functional skills (for example transfers, self-care, etc.) without seated support optimized which ultimately hampers their success, puts joints at risk for damage and directly makes the practiced mobility skill less than efficient. Additionally, many practitioners do not have the skills to teach a client to use a mobility device correctly. A perfect example is the clinician who works in a seating clinic prescribing wheelchairs and supports that does not have the ability to teach the client to transfer in/out of system or to function optimally in that system (for example manual wheelchair skills, or power driving skills). The client is at a big disadvantage if the clinician cannot teach mobility and operational skills of the prescribed device. (Physical Therapist and seating and mobility specialist for over 9 years)

Seating and mobility is one area of specialized practice for occupational and physical therapists. The therapist provides a service. The patient is the consumer of the service. Therefore, it is important that the consumer be satisfied with the service. The relationship between the therapist and consumer provides an opportunity for learning by both. The most important thing that interacting with clients has taught this group of expert therapists to be a better person and a better clinician.

Listening was overwhelmingly identified as the one thing which they learned from their clients. The relationship between the therapist and the client is a "partnership".

Wheelchair users know the most about their bodies and the way they function. It is most important to ask them what works with the system they have, what does not work, and what they have considered. They can teach me about equipment and how they have managed to solve "real life" problems to maintain their independence. It is crucial not to take away function in order to make someone "sit pretty". (Research consultant and Physical Therapist for over 17 years)

All people are different whether they have a disability or do not. This recognition of these differences by these clinicians is one thing that they have learned through experience. They recognize the importance of the consumer's knowledge of themselves and their personal goals and priorities. They recognize that the consumers must have control over their life and decisions.

They know more about themselves and their needs than I will ever learn through any evaluation process. (Physical Therapist and entrepreneur with over 14 years of experience)

Summary

A Delphi study optimizes the use of expert opinion without having to actually bring the group of experts together. Designed to collect expert opinions as independent considered views, this method offers structure and validity without a framework too formal to allow for personal, subjective considerations (Winzenried, A, 1997). The overall perceptions of the experts in Round 1 of this

study was that experience, knowledge, and sensitivity to consumers needs are all critical to the completion of a thorough seating and mobility of evaluation.

CHAPTER 5

ROUND 2 FINDINGS

Introduction

Round 1 questions were all open ended questions. They were developed to generate ideas and concepts by the expert panel. Round 1 questions focused on problem solving skills and the components needed for a successful seating and mobility evaluation, methods utilized to gain skills and knowledge, barriers which exist that may interfere with a successful evaluation, skills and knowledge that will be needed in the future, and the importance that the consumer plays in the evaluation process.

Round 2 questions were developed to expand on the responses provided in Round 1 and to further validate the data. The three overall themes of experience, knowledge and sensitivity to consumer's needs were expanded on in the formulation of the questions in Round 2. Questions were formatted in such a way that the responses in Round 1 were summarized and included in the framework of the Round 2 questions. A combination of question formats were utilized to further expand on the information gathered in Round 1.

Open ended questions were asked to allow the participants to further expand on what they provided in

round one through description, identification, and examples. Participants were asked to rank and rate specific skills, knowledge, techniques, and learning opportunities based off the answers from Round 1. They were asked a yes or no question regarding their opinion about a current ethical issue in the area of seating and mobility and were asked to expand on this answer based on their response.

The commitment of the participants in this study was evidenced by their participation in second round. In Round 2, 14 out of the 15 original participants (93%) in Round 1 participated in Round 2. In the second round the members of the expert panel were asked: (a) how they encourage ongoing participation of the consumers they serve, (b) to identify what information they gather during the interview process, (c) to rank the necessity of specific skills and knowledge needed during a seating and mobility evaluation, (d) to describe how they are able to address all areas previously identified as key components of a seating and mobility and evaluation, (e) to further clarify their use of a follow-up system, (f) to provide their opinion regarding the use of general practitioners in the area and seating and mobility, (g) to rank and rate the methods which they most consistently utilize for gaining skills and knowledge to

complete successful seating and mobility of evaluations, and (h) to provide examples of how they have been able to overcome barriers which were identified in the previous round. Again, experience was the primary key that flowed throughout the responses. Experience was mentioned and identified by all 14 or 100% of the participants throughout the data. The need for increased knowledge was woven throughout the responses by all 14 participants. The need for active consumer participation was confirmed and expanded on by all 14 participants.

Building Rapport

This group of expert practitioners are all diligent and persistent in encouraging ongoing participation by the consumers they serve. The majority are very conscientious of seeking out the consumers goals and utilizing the experience of the consumers to identify what has worked and not worked for the them in the past. Building a rapport with the consumer early on is important in the evaluation process. One of the icebreaker questions asked of the consumer is "why are you here today?" or "what are your goals?" Critical thinking and empowerment of the consumer lead to increased success and personal ownership.

I specifically ask the client what he is looking for, what features are most important to him, what

items are a "must" and what things he would like to change "if other than a first chair". The patient's goals are specifically questioned and documented (our evaluation template includes "clients goals" as a heading). I use specific questions to cue critical thinking. For example, if the patient says that he wants to "sit higher off the ground so I am not looking up so much", I will then specifically ask "if you are higher off the ground, will you still fit under tables and desks? Will you still be able to pick up items off the floor? Will the change in seat height affect transfers? "usually these types of questions help the individual and therapist to make best choices. I typically empower my clients to take responsibility for the equipment order. I provide all information, common education, options and then facilitate their own decision-making so that they take ownership of the equipment during the evaluation and intervention process which has increased successful outcomes and acceptance of interventions. (Physical Therapy clinician with over 9 years of experience)

In his book, *Developing Critical Thinkers* (1987), Brookfield presents a rationale as to why critical thinking is important and how adults can become critical thinkers. His model consists of five "commonly experienced phases" (pp. 25-27). (1) He terms the trigger event in which some occurrence prompts a sense of inner discomfort and perplexity, (2) appraisal includes brooding about the discomfort and finding others who are experiencing a similar situation, (3) exploration, in which new and different ways to explain the experience are examined, (4) developing alternative perspectives means that a new role or a new way

of thinking about the problem is developed and confidence is gained, and finally, (5) integration in which these new ways of thinking are integrated into one's life. Critical thinking allows these therapists to assess and explore a situation with open eyes and develop a plan which is in the best interest of the consumer.

Communication

Open and clear communication is important in the team process because it facilitates inclusion of the consumer in this process. This communication is encouraged prior to the evaluation process, during the evaluation process, and following the evaluation. A variety of communication tools for doing this were noted including (a) open-ended questions, (b) note taking, and (c) clarification of previously communicated items. Also identified was the use of technology such as the telephone, or e-mail to facilitate communication. All 14 of the participants indicate that through experience they have learned to be both better communicators and listeners.

Active listening is utilized to build a rapport and enhance communication. Active listening can be considered therapeutic. It involves paraphrasing the speaker's words in order to clarify that the intended meaning was attained.

In doing this, the needs of the consumer are exclusively attended to. In a sense the listener is putting himself into the shoes of the consumer. Active listening is made up of 3 processes. (1) Restatement: the words of the speaker are repeated, (2) reflection: both the content and the implied feelings of the sender are verbalized, and (3) clarification: the sender's thoughts and feelings are summarized or simplified to resolve any confused verbalizations into clear, concise statements (Davis, C. M., 1998, p 106). The use of these active listening skills facilitates open and clear communication between the consumer and clinician thus assuring that the consumer's needs are met.

Through the school of hard knocks I have learned to be a better "questioner". Ask one question--WAIT--for the client's response--do not fill in a silence period with multiple--choice options. When I have been patient and waited for the client's OWN (self-initiated) responses, I have frequently been surprised by the answers. Secondly, I frequently began an assessment with the very basic question--what do YOU want (from the new equipment--I am amazed how often response is "no one has ever asked me that question". Thirdly, especially if I am working with the supplier or another team member with the client, I try to stop and translate any professional jargon we may have been sharing, which the client may not understand. (Simple things like--translation of kyphosis = slumped sitting, rounded back). Finally a really good check for my understanding is to ask when you say " _____ "what does that mean to you?" Another very strong vehicle to use to

involve a client in the decision-making is when there is a problem-- state the concern "we have a problem...it is _____. What do YOU think we should do about this problem?" (Physical Therapist and leader in the field for over 19 years)

The Interview

The interview was identified as an important component of the evaluation process. Identifying the needs and goals of the consumer will help to assure that the consumer's needs and goals are met. Gaps in the evaluation process may lead to significant mistakes in the prescription of equipment from abandonment of the equipment to harm to the consumer (Olson & DeRuyter, 2002, p. 210). Substantial amounts of information can be gathered from the interview process. Time restraints and funding cuts have led to practitioners being more creative in the evaluation process. Many practitioners indicate that they are able to gather some information through a pre-evaluation questionnaire either mailed prior to the evaluation, taken via telephone, or sent via e-mail.

This group of practitioners described a substantial amount of information which is gathered through the interview process. Some areas were identified more consistently and frequently than others. Those areas which were most frequently and consistently identified included

(a) goals of the consumer, (b) accessibility issues such as accessibility to the home or work environment, (c) transportation issues, (d) a history of equipment which has been utilized or is currently being utilized, (e) things which they do and do not like about that equipment, (f) history of skin breakdown, (g) transfer methods into and out of the wheelchair, (h) medical history as it relates to seating, and (I) what activities they currently perform from their wheelchair. It was noted that the information gathered is dependent on the living situation of the consumer. The all-encompassing list of information gathered by the practitioner is as follows:

Goals: Goals of the consumer, goals of the caregiver, and reason for referral;

Accessibility: Home, work, school, leisure/recreation, daytime, evening, lifestyle, outside terrain, and other environments;

Transportation: Automobile, van, public, wheelchair storage, tie-down system, and storage;

Equipment: Past wheelchair/seating system, current wheelchair/seating system (age), repair history, other assistive technology (computer), other positioning equipment, other mobility devices such as walker and cane, other medical (vent, suction);

Skin Condition: Current, past problems, surgeries, method for pressure relief, time spent in chair at one time;

Transfer Method: Bed, toilet, other;

Medical/Surgery: History, planned in future, related to seating;

Daily Activities: What tasks are currently completed and with what assist, what tasks consumer wants to complete, employment/school, care-giver involvement, meal-time issues, bowel

bladder, communication;

Medical: Diagnosis, progression (need for flexibility of equipment), sensory (vision and hearing), range of motion, muscle strength, muscle tone, fine motor, gross motor, weight (historical perspective), date of birth (age), cognition (safety or behavior), medications, posture, sitting balance, height, respiration;

Funding: Alternative funding; Other Name(nickname), physician, phone, address, referral source, and reason for referral.

Technical Skills

In Round 1 of this research, several technical skills were consistently identified as important components to a seating and mobility evaluation. These skills were mat examination, simulation with simulator, pressure mapping, environmental assessment, trial of recommended equipment, and movement assessment. However, time restraints were listed as barriers to the completion of thorough seating and mobility of evaluations. Thus, the participants were asked to rate these technical skills on a scale of 1 to 5. The scale was as follows: 5=Very Important, 4=Important, 3=Somewhat Important, 2=Unimportant, and 1=Totally Unimportant.

Simulation with a simulator was left off by one participant, therefore, that row reflects 13 out of the 14 participants. Three of the five skills fell between the important and very important range (see Table 2). Only two

Table 2: Frequency and Mean of the Necessary Components Utilized in a Seating and Mobility Evaluation

Task	Very Imp.	Imp.	Some-what Imp	Unimp.	Tot. Unimp	Mean
Mat	12	1	1	0	0	4.79
Trial	9	4	1	0	0	4.57
Mvt. Assess	8	3	3	0	0	4.36
Env. Assess	5	3	6	0	0	3.92
Sim.	2	5	6	0	0	3.69
Pres. Map	1	4	8	1	0	3.36

of the skills fell between the somewhat important and important range. Not any of the skills were identified as being unimportant. The mat examination and the movement assessment both require the technical skills and knowledge of the therapist to complete. These are the baseline assessments which are utilized to start generating options and to determine the seating and positioning needs of the individual. The simulator and trial allows the evaluator to test the potential recommendations to further determine what changes or modifications to the seating system might be

needed. The environmental assessment is utilized to assure that the recommended equipment will fit the consumer's home and allow for functional independence when possible.

Regardless of time restraints, all components should be a consistent part of any seating and mobility and evaluation.

The participants were also given the opportunity to identify and rate any other skills or knowledge which they felt were important. Two participants identified goals and outcomes as very important or somewhat important. Two individuals identified transportation or storage of the wheelchair in a vehicle as important or very important. One individual also indicated that a movement assessment is very important. Two individuals noted that the need for pressure mapping is dependent on the situation. If the person has pressure sores or a history of pressure sores, it would be very important. If not, it would be unimportant or totally unimportant. It was also noted that the amount of time spent in all of these areas is very consumer oriented. It is very dependent on numerous factors such as the current living arrangement.

Knowledge and Experience

The ability to complete a thorough seating and mobility evaluation requires a combination of many factors. These

factors include (a) sound technical knowledge, (b) knowledge of bio-mechanics of seating and the seated posture, © knowledge of the current seating and positioning equipment available, (d) knowledge from past experiences, and (e) the ability to listen to consumer's needs yet set realistic, functional outcomes. A number of strategies were identified that help to facilitate this process.

Drawing on past experiences allows the evaluator the opportunity to utilize that knowledge of what has worked and what has not worked which reduces the potential for mistakes and decreases the amount of time it takes to provide the service. Experience also helps the clinician to constantly be thinking in the future, for example what needs to happen next in the evaluation process. Networking and teamwork allows the evaluator to draw on the experiences from the entire team. Not only does this allow for a more complete and thorough evaluation, it also saves time in the process as certain team members have certain knowledge which is readily accessible, and thus the person facilitating the evaluation does not have to go look for the information. The consumer is also considered a team member who provides information to the team process. Listening to the consumer helps to assure that functional skills are maintained or

enhanced, and personal goals are met.

Knowledge from past experiences comes in handy when you're working with the consumer that has the same type of problems as someone you have seen previously and you resolved in a certain way. It cuts down on mistakes and reduces time. Throughout, we're listening to the consumer and discussing what is realistic and what is not realistic based on their needs. (Physical Therapy consultant for over 23 years)

Networking

Networking with other clinicians personally and via e-mail is frequently utilized. It is important to take the time to listen to the consumer, understand the consumer's needs and goals, complete a thorough assessment, and have the consumer test products to see what does and does not work.

New clinicians seek input from seasoned clinicians and suppliers. They ask consumers to identify all goals then prioritize with the understanding of the need to compromise. Have clients test products to see what is realistic and what is not. (Occupational Therapist with 14 years of experience)

The majority of the participants have gained their sound technical knowledge through training, experience, and networking. Therapist have found that going to continuing education courses, and both networking with other therapists and networking with the rehabilitation suppliers are beneficial. While some things rarely change, such as how to

do a mat evaluation, other things like equipment that is available and the equipment's pros and cons requires continuous study through continuing education, reading, and surfing the Internet.

Experience and Training

Knowledge of the bio-mechanics of seating and the seated posture requires experience and training. One therapist indicated that it is her opinion that this is the most essential contribution of the therapist to the team process. The therapist must be able to pull all of the information together and synthesize this information and apply the information and make recommendations based upon the consumer's needs and goals. The therapist must remember however that the consumer's bio-mechanics in the seated position may change based on the individual's goals.

Knowledge of the current available seating and positioning equipment available is primarily gained through the team process, continuing education opportunities, trade shows, reading, and training. The team member that contributes significantly to this process is the rehabilitation supplier. The suppliers typically have access to the manufacturer and equipment. Therefore they should know products, both old and new that are available.

The supplier should also have some experience with the various pieces of equipment and thus should know some of the pros and cons. Although it is important to have a good working relationship with the supplier, the therapist should also maintain a current knowledge of available equipment. The importance of this knowledge was described by one of the participants.

Vendors are out to make money. They have lots of product information; however they may not always have all the details of which feature matches best to which bio-mechanical or functional issue. As I have worked I have learned a lot about available options. Now I have no problem talking with vendors who bid on chairs and tell me there "is not that option available", when my actual experience tells me otherwise. I feel that my own knowledge of the variety of equipment is helpful when I tell or demonstrate to patients. This puts me in a "neutral" position that allows the patient to more easily choose, rather than being "pressured" by a sales man who may only deal with one or two options. I think it's my role to give options that are viable and safe, and to help consumers know the questions to ask once they become involved with a vendor. (Physical Therapist and consumer advocate with over 18 years of experience)

The importance of experience has been recognized by this group of experts. A variety of strategies have been developed such that this experience can be used and not lost. One therapist identified that a tool she has utilized is keeping a database of specific cases and solutions that can be referred to as needed. Another uses pictures to help

her remember solutions to key issues. An open environment where people are comfortable sharing experiences and are not afraid to ask others for opinions or ideas is important. Experiences and a repertoire of skills, both bad experiences and good experiences can be helpful in guiding the therapist through the decision making process.

I have learned the most from my past "mistakes". Only when I looked critically at why people were either not using my recommended equipment or not using it in the "desired" fashion-did I begin to question my "clinical practice"-adjusted that-practice to aim toward more functional objectives to achieve better outcomes. (Physical Therapist and leader in the field for over 19 years)

Also noted was the past experiences that the consumer has had. This experience provides a wealth of information such that the therapist can be more helpful in the future.

Malcolm Knowles, one of the leader's in the adult education movement builds on the value of the prior experience of the learner as a core adult learning principle which should not be overlooked. The evidence of the importance of this principle repeats itself through the responses of the participants in this study (Knowles, 1975, p. 20).

The ability to listen is often taken for granted. Therapists agree that it is important to actively involve the consumer and "be a good family centered health-care provider". Once the therapist accumulates the knowledge and

information through good listing skills, they must be able to openly communicate to the consumers and help the consumers prioritize their choices.

Many times by listening to the consumers needs I can much more easily define the realistic, functional outcomes--because the needs are the functional outcomes. (Physical Therapist with over 19 years of experience)

Follow-Up

Follow-up, both formal and in-formal, was supported by all the participants just as in Round 1. For some, formal follow-up is a "luxury" due to the amounts of time and difficulty to implement. When a formal follow-up system could not be implemented however informal follow-up was then used. Strategies utilized for formal follow-up included telephone follow-up completed either by the therapist or a volunteer, follow-up fittings for training in use of the equipment, scheduled clinic visits, contact with case managers, mail surveys, or at the time the consumer returns for a yearly re-evaluation.

Methods of informal follow-up also varied. The most consistent method identified is when the client contacts the therapist with a problem with their wheelchair or seating system and modifications are needed. Another method identified included seeing the consumer or family members in

the community and "checking in". E-mail and phone contact are also identified as methods of informal follow-up.

The time frame in which follow-up should be completed varies. This variance seems to depend upon the situation. If there are identified issues that may be problematic, a follow-up appointment may be scheduled within 1 month. It may also be dependent on the consumer's living arrangement and who takes care of the equipment. In some more "controlled environments" where therapy aids maintain the equipment, frequent follow-up may not be necessary. The complexity of the disability also affects the amount of follow-up and how often follow-up is needed. Sometimes, a combination of methods may be used. For example, a staff person may telephone the consumer 1 to 3 months after delivery, and at that point it may be decided whether the consumer needs to be brought to the clinic for a more formal follow-up appointment.

Experience Reiterated

The expert panel of practitioners identified several key areas required for the completion of a successful seating evaluation which included knowledge of the current available equipment and technology, the ability to complete a thorough clinical assessment in relation to the seated

posture, and experienced clinical reasoning and decision-making skills. This group of experts consistently indicated that these skills and knowledge have been gained through experience. Although general practitioners or rehabilitation suppliers have not typically received any additional training in the area of seating and positioning, general practitioners or rehabilitation suppliers are still often called upon to evaluate and make recommendations in the area at seating and mobility. The panel was asked their opinion whether or not this posed a risk to the consumer. All of the panel members responded with a unanimous "yes" response. If they answered yes, they were then asked to provide what they see as a viable solution to the problem of general practitioners completing seating and mobility evaluations even though they may not have the training or skills to do so.

This group of seating and positioning expert practitioners suggested some viable and attainable solutions to the problem of general practitioners or rehabilitation suppliers being asked to evaluate and make recommendations in an area in which they may not have skills or knowledge. It is the opinion of many of these expert practitioners that a certification or credentialing process needs to be

implemented specifically for seating and mobility. Such a certification would help consumers, funding sources, and others identify a level of competency. In fact, it was suggested that the funding of systems be contingent upon the credentialing of the clinician. The risk is when providers or suppliers do not recognize their scope of practice or expertise and do not recognize when a case is beyond their capabilities and do not know who or where to go for assistance.

Therefore, training practitioners to know when and where to refer is also a necessity. This training is not only a necessity for the practitioners but also for the funding sources. Funding agencies need to be aware that not anyone can help the consumer. This includes both private insurance companies and Medicaid.

Availability of education for practitioners is needed. This education needs to be provided at a variety of levels. General practitioners need some exposure and training in the basics of intervention. They also need training on the existence of specialists, how to recognize when they need to refer to a specialist, and how to make the referral.

Physicians seem to be able to handle this arrangement and other specialty therapy--like hand therapy for example. All have seemed to be able to survive with this arrangement, seating and

wheeled mobility should be treated no different.
(Physical Therapist with over 13 years of
experience).

Seating clinics are often available, especially in larger metropolitan areas. The availability of these clinics needs to be advertised both to the medical community and the general population. These clinics need to be expanded into the rural areas. This could be possible through the use of mobile clinics or satellite clinics.

Not only were specific recommendations made by this panel of expert practitioners, but a combination of the suggestions was also identified.

In the short-term I think we need to think of a "triage" model. Not every disabled person needing a wheelchair needs to have a "full-blown" assessment. We need to give general practitioners and rehabilitation suppliers some guidelines to recognize when to refer on--for example use the Braden Risk Score as a "filter"--passive range at the hips is less than 80 degrees--hamstring tightness keeps the knees flexed more than 90 degrees, spinal curves greater than 30 degrees, sub-luxing hips. If we could have a few "danger signs" and provide early detection skills--to be done during the "routine" wheelchair prescription, perhaps we could get the right people right providers in a more timely fashion. (Physical Therapy Leader in the field for over 19 years)

Concern for the consumer and consumer advocacy and an open mind and creativity can make a difference in the long run. Ultimately, establishing a recognized standards of practice or code of ethics could help define competent

practice.

Education

A number of ways were consistently identified in Round 1 as methods utilized for gaining skills and knowledge to complete successful seating and mobility of evaluations. These methods included (a) experience, (b) continuing education courses, (c) peer mentoring, (d) trial-and-error, (e) reading, and (f) trade shows. In Round 2, the panel of experts were asked to rank these six methods according to the frequency with which they use them (see Table 3). They ranked the method which is used most frequently as one and that method which is used least frequently as six.

Table 3: Frequency of Utilized Learning Opportunities

Learning	1	2	3	4	5	6
Exp.	9	3	1	1	0	0
Cont. Ed.	3	5	3	2	1	0
Peer Ment.	2	1	2	3	2	2
Trial/ Error	0	2	3	3	2	4
Reading	0	0	2	5	3	4
Trade Shows	0	2	2	1	5	4

One participant ranked reading two times (as 3 and 5) and did not rank peer mentoring. Therefore, for that participant an average of 4 was utilized for reading, and no ranking was utilized for peer mentoring in the final data accumulation. This accounts for peer mentoring numbers being less than 14 when added together.

The data revealed that experience is the most frequently utilized for learning. Continuing education opportunities and peer mentoring opportunities are used a little less frequently. The other methods which are trial and error, reading, and trade shows are used significantly less frequently.

The practitioners were then asked to rate how beneficial these learning opportunities have been to them in their practice utilizing the following scale: 5=Very Beneficial, 4=Beneficial, 3=Somewhat Beneficial, 2=Not Beneficial, 1=Will Never Use Again (see Table 4). Over three-quarters of the participants utilize experience as a learning opportunity followed by continuing education and peer mentoring. The most frequently utilized learning opportunities which are experience, continuing education courses, and peer mentoring have also proven to be the most beneficial and rated on the average above a 4 and beneficial

to very beneficial. The 3 learning opportunities which are identified to be less beneficial averaged below a 4, and are also used less by the practitioners. Those opportunities are trial and error, trade shows and reading.

Table 4: Beneficial Rating of Learning Opportunities

Learn. Opp	Very Ben.	Ben.	Some. Ben.	Not Ben.	Not Used	Mean
Exp.	14	0	0	0	0	5.00
Cont. Ed.	8	4	2	0	0	4.43
Peer Ment.	6	7	1	0	0	4.36
Trial Error	5	3	6	0	0	3.93
Trade Shows	4	5	4	1	0	3.86
Read	1	4	9	0	0	3.43

Barriers Overcome

Four primary barriers were identified to potentially interfere with a successful seating and mobility evaluation. These barriers included: (a) time restraints, (b) limited funding, (c) unavailability of equipment for trials, and (d) limited access to complete an environmental assessment. Participants were asked to further elaborate on these barriers and provide strategies which they have utilized to

overcome these barriers.

These therapists have learned to overcome time restraints with experience. Time restraints have been primarily overcome by using time more efficiently, scheduling more than one appointment, or scheduling longer appointments. Some methods for better time utilization included gathering information prior to the actual appointments utilizing an office manager or a volunteer or gathering information remotely such as by utilizing the e-mail system. Again, it was noted that with experience, clinicians have learned how much time is needed for a thorough evaluation, and they are better able to schedule accordingly.

Funding issues can be minimized with creativity, strong justification, advocacy, and encouraging the consumers to advocate for themselves. Some of the creative strategies which this group of expert practitioners have utilized include: seeking funding in their communities from agencies such as their churches, fund-raising. alternative funding sources such as Friends of the Disabled, utilizing loan closets, encouraging manufactures to donate demonstration equipment, purchasing used equipment, and requesting equipment from local service agencies for example the

Jaycees or Ambucs.

Strong medical justification is beneficial in the funding process. Additionally, photos, videos, or copies of pressure maps can be encouraging to a funding agency when they are deciding whether or not to pay for a piece of equipment. If the denial for the equipment occurs, an appeal is necessary. The evaluator should determine the best method to appeal the denial, and consumers should also be encouraged to advocate for themselves.

The majority of this panel of expert practitioners have overcome the unavailability of equipment through networking. The most common source identified for borrowing equipment is the manufacturer or the manufacturer's representative. Several of the practitioners either have loaner or demonstration equipment themselves, or they have identified an outside source for such equipment. Again, networking, and utilization of outside sources has helped these therapists overcome this barrier.

These therapist have also found ways to overcome limited access to the completion of an environmental assessment. Networking and team support have again proven to be useful. Many of the therapists ask their rehabilitation supplier to take equipment; for example, they

may take a wheelchair to the consumer's home to determine its accessibility. They also ask the consumer's therapist to look at these issues prior to the evaluation process. Many times they will ask the consumer to do detailed drawings and measurements, take pictures or make a movie of the environments in which they spend their time, and bring them with them to their evaluation. Experience, creativity, advocacy, and networking are tools which have been learned and utilized by this expert panel of practitioners to overcome many of the barriers which may exist in the field of seating and positioning.

CHAPTER 6

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

Purpose

Most people take for granted the everyday things they do in life such as taking a shower, preparing a snack, or even going to bed at night. People with physical disabilities however cannot take these things for granted. These everyday activities can be time-consuming, exhausting, and even impossible without the proper resources. Assistive technology is one resource that can make a positive difference on a person's life. However, if it is not an appropriate piece of technology for that individual, it can also have adverse effects both functionally and medically. The wheelchair/seating and mobility system is one example of assistive technology that can make a difference in an individual's life.

No special training is required to prescribe or sell wheelchairs or seating and mobility systems. Such systems are typically sold through durable medical equipment stores. A poorly prescribed seating and mobility systems can have a negative affect on an individual just as much as a well prescribed system can have a positive effect.

Many of the payment sources such as insurance companies, Medicare, or Medicaid do require that a rehabilitation specialist write a letter of medical justification before they will authorize the system. Typically, the rehabilitation specialist is an occupational therapist or a physical therapist. Both therapists should have a thorough understanding of disabilities, bio-dynamics, anatomy, and the human development process. However, the general practice therapists do not receive extensive training in these areas as it relates to the seated posture or the wheelchair. An occupational or physical therapist may be asked to complete the wheelchair evaluation yet may not have the proper knowledge or skills for this task. Therefore, an ethical dilemma may occur.

Should the therapist complete the evaluation, or should the therapist refer it on to someone with more experience and knowledge in the area of seating and mobility? What assures that a therapist has such skills and knowledge? The repercussions of this single decision can be enormous. Unfortunately, the individual most effected by the outcomes of this decision is the consumer. Standards of practice in this area must be identified as a starting point to prevent the client from receiving an improper piece of

equipment.

The identification of best practices in a field is the initial step in the identification and development of standards of practice. Therefore, the purpose of this study was to describe the perceptions of occupational and physical therapists who specialize in seating and mobility evaluations about the current best practices in the field. The focus was placed on determining best practices of the leaders in the field.

Design

A descriptive research design was utilized in this study. Specifically, the Delphi technique was used. With the Delphi technique, opinions are collected from a geographically dispersed panel of experts. The panel of experts for this study were gathered using the snowballing technique. To implement this technique, five experts were initially identified by the researcher. This group of five experts agreed to participate in this study. This study and the "expert criteria" were described to these experts. They were asked to identify other practitioners in the field that would also qualify as an expert. Twenty-six more practitioners were identified. An attempt was made to contact all potential participants by e-mail or by

telephone. Out of these contacts, 15 expert practitioners agreed to participate in the study.

The Internet was the tool used for the collection of the data. Questions were developed and sent to several experienced therapists in the field to assure validity of the questionnaire and to assure that the Internet survey method would be user-friendly. From this feedback, modifications to the questions were made and Round 1 was sent to the participants.

Round 1 consisted of opened ended questions which looked at (a) the seating and mobility evaluation process, (b) skills and knowledge needed for a thorough evaluation, (c) methods used to gain these skills and knowledge, (d) barriers which may exist that hinder the process, (e) changes in the field, (f) the learning process, and (g) questions regarding ethics. Several patterns and themes emerged out of Round 1 and a second round of research was sent to the participants for confirmation and clarification. In Round 2, 14 of the original 15 participants responded. The patterns and themes which had emerged in Round 1 were confirmed and expanded upon by the participants in the second round.

Findings

In Round 1, the panel of expert practitioners answered the questions thoroughly and completely. As a result, three overall themes emerged from the data. These themes were experience, knowledge, and sensitivity to the consumer's needs. Throughout all of the answers, the need for experience consistently emerged. This experience was noted whether it be in relation to specific hands-on skills or drawing from past experiences to make decisions. The need for knowledge was also identified. A need for both basic knowledge and skills, for knowledge of new technology, and for the ability to know when and how to merge these together was identified as being important. However, not only are experience and knowledge an important prerequisite to a thorough seating and mobility evaluation, sensitivity to consumer needs was also recognized as a necessity. This group of expert practitioners recognized that although they may have the experience, skills, and knowledge to complete the seating and mobility evaluation, it is irrelevant without the input from the consumer.

In Round 2, this group of expert practitioners elaborated, expanded, and confirmed the results of the data from Round 1. Experience, knowledge, and the importance of

consumer participation continued to be evident in this round. However, this round also resulted in a prioritization of the specific skills and knowledge needed for the completion of a thorough seating and mobility evaluation and specific strategies and details utilized by these practitioners to gain these skills and knowledge. These practitioners further expanded on the barriers which exist in the area and seating and mobility, and strategies which they have utilized to overcome these barriers. As a result of the data elicited from this panel of expert practitioners in the area of seating and mobility, best practices can be defined as a multi variate complex series of interactions in which the expert clinician uses experience, hands on techniques, skills, technology, resources, self- directed learning, follow-up, and a relationship with the consumer in the provision of services.

The Wheel

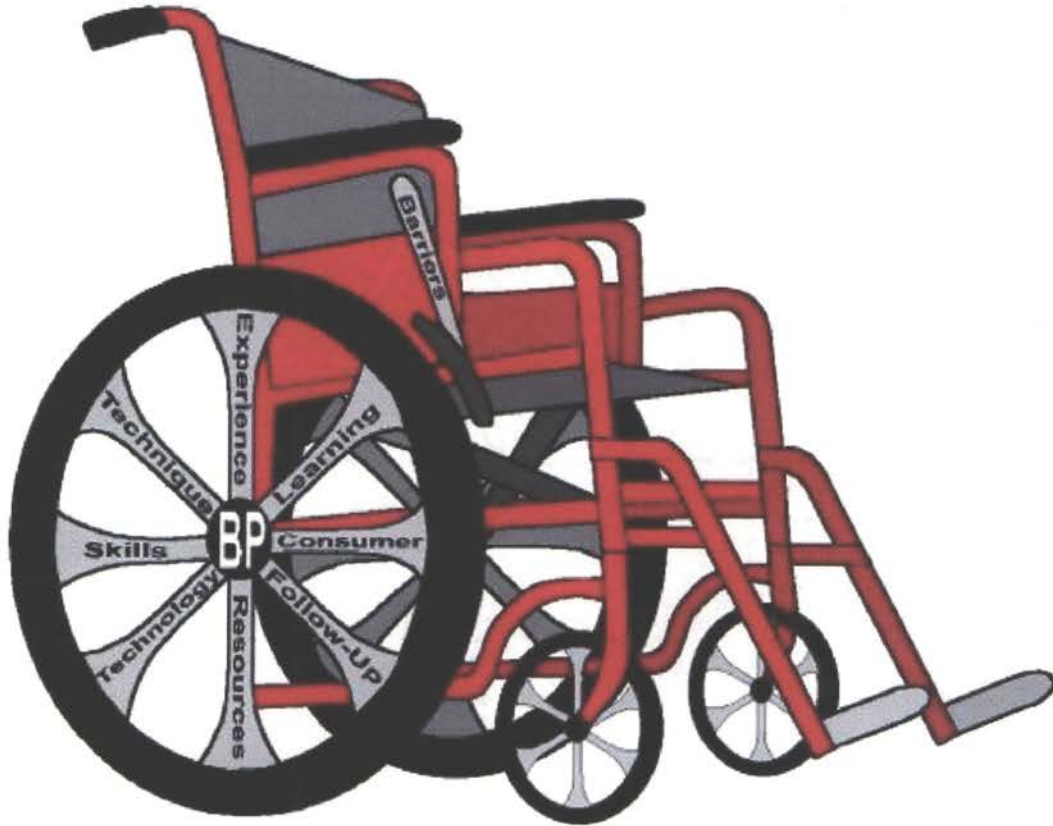
Best practices in the area of seating and mobility can best be depicted by the metaphor of the wheel (see Figure 1). In this metaphor, the hub represents the concept of best practices. Around that hub are all the concepts that were identified by the panel as necessities for the implementation of best practices in the area of seating and

mobility. These are represented by spokes. The spokes include: (a) experience, (b) hands on techniques, (c) skills, (d) technology, (e) resources, (f) self-directed learning, (g) follow-up, and (h) consumer relationships. If a spoke is missing or broken, the wheel does not run smoothly. Also included are the barriers, which can best be represented by the brake. On a wheelchair, just as a brake can slow or stop the wheel, so barriers can be a hindrance on the road to best practice. However, as noted by this panel of expert practitioners, these barriers can and should be overcome.

Experience

This panel of experts recognized that experiences is a key element in the implementation of best practices in the area of seating and mobility. This experience was identified throughout all aspects of the data both in Round 1 and Round 2. It is this experience which has contributed and moved these practitioners from the level of novice to expert. Knowles advocates that the major differences between experts and novices are intellect and experience. Experts solve problems differently than novices (Knowles, 1998, p. 231). Experts tend to know more about the context, and their knowledge tends to be more organized and efficient

Figure 1: The Wheel of Best Practices in the Area of Seating and Mobility



than the novice. Experts are individuals that have learned through experience. They are more likely than the novice to utilize relevant information, they are less likely to be influenced by irrelevant cues than novices, and they are less likely to be overconfident than novices (Byrnes, 1998). They do not create solutions from scratch for every problem situation. Instead, they make use of previously stored information in such a way that facilitates coping with the current problem (Sternberg, 1990, p. 133). They have a thorough understanding of how to organize, represent, and interpret learned concepts in their environment, which affects their ability to remember, reason, and solve problems (Shelton, 2003, p 137). Their experience takes them to a high level of concept formation.

Educators including Lindeman, (1926), Dewey (1938), Knowles (1973) and Brookfield (1986) have talked about the role of experience in learning. However, experience is too broad of a term to adequately identify what this group of expert practitioners are describing. When concept formation levels are high, it is natural and easy to utilize new experiences which are linked to past experiences. However, when they are low, it is more difficult for development and organized structure to occur. For example, the

hierarchical process in learning principles, generalizations, and concepts are best learned as a result of moving from a concrete phenomena to higher-order abstractions (Bloom, Hasting, & Madaus, 1971, p. 165). The experts in this study had a highly sophisticated level of concept formation which they utilize in the seating and mobility process. Learning pertains to experience and experiencing. To learn is to experience and to interact with one's environment (Smith, 1982, p. 36). How the learner reflects on and thinks through these experiences helps the learner to assimilate new information. The nature of experience varies according to the conceptual level that the learner brings to a new context. Learner's organizational structure is based on past experience. This group of expert practitioners demonstrate the ability to utilize experience at a high contextual level.

Hands on Techniques

This group of highly skilled therapists recognized and identified that their skill acquisition and implementation has progressed to a higher level. Schon (1982) calls this reflection-in-action (p. 50). It is the ability to find the groove. Therapists may make conscious decisions that should be based on research and theories. However the

therapists are also dependent on tacit recognitions, judgments, and skillful performances. Schon first identifies knowing-in-action. In knowing-in-action, the practitioner applies knowledge to instrumental decisions. Basic knowledge and "know-how" are applied. Knowing-in-action is characterized by ordinary practical knowledge. (pp. 50-54).

Schon 1982 described reflection-in-action. Reflection-in-action takes knowing-in-action to a higher level. It involves professionals knowing how they have been completing a specific skill. For example, in the completion of a mat examination and in knowing how well it has been working, it involves using the bases of these thoughts and observations to change the way things are being done. It is the process of getting the "feel" of something. It is knowing when something "feels right", and so this process is embedded into one's being such that it can be repeated in the future. "In such processes, reflection tends to focus interactively on the outcomes of action, the action itself, and the intuitive knowing implicit in the action" (p. 56). As stated by one of the therapists, "I have embedded all my clinical knowledge as a treating therapist into my being."

This group of expert practitioners have developed the

ability to reflect on their knowing-in-practice. They are able to reflect in the mist of the activity and to turn that reflection into action. When professionals reflect-in-action, they become researchers in the practice context. They do not just dependent on the categories of established theory and technique but are able to construct a new theory for it in each case. This ability is not just a skill; it is an art. Reflection-in-action is critically important. The therapist's ability to demonstrate reflection-in-action through the use of their hands-on techniques could also be considered best practices-in-action.

Skills

A number of skills were identified in Round 1 that are necessities for the thorough implementation of a seating and mobility evaluation. Specifically, the skills included (a) the ability to perform a thorough mat assessment, (b) the ability to simulate the desired position through utilization of a seating simulator or trial equipment. (c) the ability to utilize and interpret a pressure mapping system, (d) the ability to apply bio-mechanical anatomical knowledge appropriately to the situation, which includes a thorough movement assessment (e) the ability to complete a thorough environmental assessment, and (f) the ability to perform a

complete and thorough interview. Many of the therapists expressed that they often feel pressured by lack of time. However, in spite of this, they recognized that all of the skills and knowledge are important, and the evaluation process should not be compromised due to time.

Some of these components are contingent upon the specific situation. It was recognized however that pressure mapping may not always be needed. The use and expense of pressure mapping is dependent on the consumer's needs and the specific situation. If no problems with pressure sores have been noted, pressure mapping may not be warranted. Also, an environmental assessment may not always be needed. For example, if the consumer lives in a nursing home and is not attending functions or activities outside of the nursing home, the expense of such an assessment may not be warranted.

On a scale of one to five with five being very important and one being unimportant, almost all of the participants (12 out of 14) indicated that the mat assessment is very important. Also of highest importance was the trial of recommended equipment (with nine rating it as very important, four rating it as important, and one rating it as somewhat important); and movement assessment

(with eight rating it as very important, and three rating it as important or somewhat important).

The ability to complete a thorough interview is also an important skill that the seating and mobility therapist must possess. A tremendous amount of information and insight can be gained through the utilization of a complete and thorough interview process as demonstrated by the responses of these expert practitioners. On the surface, the ability to interview appears to require no more than knowing how to talk and listen. Beneath the surface, however, interviewing is both an art and a science that requires skill, interpersonal understanding, insight, sensitivity, and concentration. It allows the person completing the interview to enter into another person's world and to better understand that person's perspective. It also allows the interviewer to learn things about the individual that cannot be directly observed (Patton, 1987, p. 108).

It is the responsibility of the person completing the interview to provide a framework within which the consumer can respond comfortably, accurately, and honestly to the questions which are presented. A well-conducted interview allows consumers, who are being interviewed, to respond in their own words best expressing their own personal

perspectives. Good interviews also allow the consumers to talk freely and to elaborate about their point of view. (Bogdan & Biklen, S. K., 1982, pp. 135-137; Patton, 1987, pp. 108-115).

Technology

Best practices includes an understanding of technology. An understanding of the technology available and the strengths and weaknesses of the technology allows the therapist to make sound realistic decisions about its use and application. Without this knowledge and understanding, unrealistic goals might be established both by the evaluator and by the consumer. This can potentially lead to failure of the seating and mobility system to meet the needs of the consumer, and thus it can lead to frustrations and even harm.

Some skills are foundational. One participant identified these foundational skills as static skills. These foundational skills are basic and very rarely ever change. Without the basic knowledge and understanding of these foundational skills, the understanding and knowledge of newer technical skills is useless.

Some things like how to do a mat evaluation are static knowledge that rarely changes, however knowing about current equipment requires continuous study. (Skilled clinician with over 30

years of experience)

Best practices involves the use of an understanding of the basics combined with an up-to-date knowledge of the new and the ability to use the two together. This includes an understanding and application of "old technology" and "new technology". Not only is an understanding of both technologies important, but the ability to analyze and combine the two also separates the novice from the expert and separates best practice from average practice.

Resources

Best practices also involves knowing one's resources and knowing how to attain and utilize one's resources. The only man who is educated is the man who has learned how to learn, how to adapt and change (Rogers, 1969). This involves the learning how to learn concept. A key component to this concept is knowing how to plan, evaluate, and select resources (Smith, 1982). This group of expert practitioners recognized the necessity of this skill and have gained the skill. They have learned which resources to use and not to use and to use those resources well.

Networking is one form of resource which was identified. Two huge sources of information for the seating and mobility specialist are the manufactures representative

and the durable medical equipment supplier. These individuals have knowledge of current equipment available and should know the strengths and weaknesses of such equipment. However, these individuals are sales people. Therefore, they are also out to sell their product. The therapist therefore must also maintain some familiarity with the various products so that they can work with these individuals with an open yet cautious mind.

Another valuable resource identified was other therapists practicing within the field. Therapists utilize each other to bounce around ideas. Also different therapists have different levels and kinds of expertise. For instance, some therapists may work with individuals with developmental disabilities while other therapists specialize in working with people with spinal cord injuries. These two different consumer populations require different seating and positioning strategies. Those who utilize best practices know when a referral or situation is within their realm of practice. If it is not, they seek out proper resources, and they refer appropriately.

Self-Directed Learning

Seating and mobility therapists who desire to utilize best practices concepts recognize the need for continuing

education. In the dynamic field of assistive technology, and more specifically seating and mobility, much of the information quickly evolves and changes. Those therapists wishing to utilize best practices, must be active in their own search for additional knowledge and skills. Although experience was identified by 100% of the participants as the method with which they have gained the majority of their skills and knowledge, these skills and knowledge have not been gained through experience alone. They recognized the classic approach to adult education that:

To make true use of our particular talents we who are learners must be intimately involved, to different degrees and in different ways, in the entire learning process. We must learn how to participate effectively and must do so. We must learn that how we are taught is as important as what we are taught. We must learn to feel responsible for the success of the learning adventure by becoming involved in the dynamics of the adult learning process (Bergevin, 1967, p. 4).

Continuing education courses, peer mentoring, trial-and-error, reading, and utilization of trade shows are all identified methods in which therapists further their learning. Of these educational methods, continuing education courses have been found to be the most beneficial followed by peer mentoring, trial-and-error, trade shows, and reading.

This group of expert practitioners have recognized the

need for continued growth and learning in their field of practice. They have recognized the need for lifelong learning and have demonstrated the skills of a self-directed learner. Malcolm Knowles, one of the great leaders in the adult education movement, identified six assumptions for the adult learner. These concepts include the learner's need to know, the self-concept of the learner, prior experience of the learner, the readiness to learn, orientation to learning, and motivation to learning. All 15 of the experts who participated in this study have supported this theory as demonstrated by their own career path.

Although many professionals may exhibit initiation and self-direction, there will often be the need to raise the awareness of the current issues and concerns for research into these areas that are rapidly changing. It cannot be simply assumed that just because people are adults, they are therefore self-directed learners and will teach themselves (Brookfield, 1987; Tough, 1979). Professionals need facilitators to bring issues to a level of awareness in order to be able to initiate their learning activities. The identification of best practices can help facilitate this process. Clinicians who wish to practice within the context of best practices must also consider themselves life long

learners and thus continue to self initiate their own learning endeavors.

Follow-Up

One important aspect of best practices is follow-up. Once an evaluation is completed, a plan developed, and the plan implemented, it must be determined whether the recommendations and the plan worked. Follow-up is identified as the best method for this confirmation. Follow-up was identified and defined as both formal and informal in nature. Both forms of follow-up are extremely useful. Ideally, both forms of follow-up should be utilized. For example, informal follow-up can be completed when the consumer returns for adjustments or modifications to the seating system or wheelchair. At that time, questions can be asked to determine the effectiveness of the plan and the consumer's satisfaction level. Something as simple as a telephone call or an e-mail by office personnel or a volunteer to determine whether any problems exist can be completed. This can then be followed up by an appointment if warranted.

Formal follow-up may consist of a formal questionnaire to determine satisfaction by the consumer. In certain environments, wheelchair follow-up appointments can be

scheduled in conjunction with other medical appointments such as an orthopedic examination. At this time, the satisfaction level of the consumer can be determined and more objective data could also be gathered from an orthopedic or medical standpoint.

Through the follow-up appointment, it should be determined whether the consumer's goals have been met. These goals may cover a broad spectrum. For example, the goals may relate to a person's ability to propel the wheelchair independently. The goals may also address other areas of activities and daily living or may be medically oriented such as improving posture or eliminating skin breakdown. All of these things should be addressed during the follow-up appointment.

Best practices in the area of follow-up must be consumer specific. How often, how frequently, and what type of follow-up should be determined by the needs of the consumer. Regardless of the details, follow-up is a component of best practices in seating and mobility.

Consumer Relations

Consumers know best their needs, goals, and desires. Therapists utilizing the best practices model recognize and embrace this fact. The expert practitioners who

participated in this research project are all very aware of the important part that the consumer plays in the seating and mobility evaluation process. As put by one participant, "they know more about themselves and their needs than I will ever learn through any evaluation process." They recognize that they must not be just a skilled therapists, but also that they must be good listeners. In working with stakeholders, the advice given by Zeno of Citium in 300 B.C. is still highly relevant: "The reason why we have two ears and only one mouth is that we may listen the more and talk the less" (Patton, 1987, p. 108).

No matter how skilled and knowledgeable the therapist is, the consumer will be the one living with the results of the evaluation. Without the consumer who needs and utilizes the seating and mobility system, the need for a thorough seating and mobility evaluations is non-existent. Likewise, without a seating and mobility evaluation implemented well and through the use of best practices, the consumers will not benefit from technology that can maximize their skills as a result of improved positioning and comfort. Therefore, it can be said that best practices involves a partnership between the consumer, the rehabilitation specialist, and the other members of the evaluation team. The consumers bring

to the process their own personal experiences, skills, and knowledge of their needs. The seating and mobility specialists brings to the process their own experiences, skills, and knowledge. All of these experiences, skills, and knowledge which are brought to the process by the therapist should be through an identified and defined model of best practices as evidenced by research in the field. The identification and recognition of the consumer brings the model of best practices full circle.

Barriers

The model of best practices recognizes that barriers can and do exist which may interfere with a thorough seating and mobility evaluation. However, this model of best practices also recognizes that a constant effort should be made to overcome these barriers. The first step in overcoming barriers is the identification of the barriers. Barriers which currently exist in the area of seating and mobility included time restraints, limited funding, unavailability of equipment for trials, and limited access for the completion of an environmental assessment. Experience has helped these clinicians recognize that barriers do exist that can be overcome. Creativity, and the ability to think outside of the box are skills which these

therapists have developed and utilized to overcome these barriers.

Time restraints can be overcome through proper scheduling, the utilization of volunteer staff or office staff to obtain information prior to the evaluation, and the utilization of technology such as computer-based evaluations. Funding problems can be overcome through the use of service organizations or agencies that loan equipment and thorough documentation of the need, and close cooperation with billing departments. Unavailability of equipment is most typically overcome by utilizing various resources such as borrowing from the manufacturers or the durable medical equipment dealers. Time restraints often limit the ability for the completions of environmental evaluations. Environmental evaluations can be completed by other members of the team, or the consumer can make a video or take pictures and measurements of the environment.

Summary

In the area of seating and mobility evaluations, best practices can best be depicted and illustrated by a wheel similar to a wheel found on a wheelchair. In the center or axle of the wheel is the concept of best practices. Going out from this center are the spokes. The placement and

strength of each one of the spokes is independent yet interdependent on the other spokes. The wheel requires that all of the spokes be in good working order for it to function properly. These spokes of best practices include experience, hands on techniques, skills, technology, resources, self-directed learning, and the consumer. Not only does a wheel have spokes, but it also has a brake. This brake has the potential to slow or even stop the wheel. However, if the brake is not applied, it has no effect on the wheel. When the wheel is functioning properly, it can be put into motion.

The Wheel in Motion

Best practices is the foundation on which standards of practice are built. As a result of this research project, best practices are depicted by the metaphor of the wheel. The wheel is a dynamic object with the potential to move forward. This research was completed to increase the knowledge and understanding of the components of best practices for occupational and physical therapists in the area of seating and mobility. This wheel can be moved forward by recommendations in the areas of Occupational and Physical Therapy Practitioners, researchers, the government, the consumer, professional organizations, funding sources,

and adult educators.

Occupational and Physical Therapy Practitioners

Occupational and physical therapists are trained to perform their diverse roles that require multiple skills and knowledge. Typically, higher education programs train therapists to perform entry-level skills after passing their certification examination. In these entry-level programs, the therapist learns bio-mechanics, anatomy, and human development, which they will utilize as practicing therapists. These therapists also learn the very basics of wheelchair technology. The entry-level therapist does not have extensive exposure to bio-mechanics, anatomy, and human development as they relate to the seated posture. Also, they typically do not have the opportunity for extensive exposure to the various technologies and seating and mobility products available. Most importantly, however, they do not have experience. Unless as a student therapist, a choice is made to specialize in assistive technology, they will have little exposure in this area when they enter the field.

The field of assistive technology and more specifically seating and mobility is a highly specialized field. The experts in this area have confirmed that best practices

involves experience, knowledge, specialized skills, and ongoing self-directed learning. As one therapist put it, "general practitioner physicians are not asked to do neurosurgery, so why are therapists who are not experienced doing seating evaluations"? Therefore, the general practicing community of therapists have a responsibility, and the seating and mobility specialist's have a responsibility.

The general practicing therapists have a responsibility to recognize their own skills and knowledge and their limitations. With this recognition, they have a decision to make. When asked to complete a seating and mobility evaluation, they must determine whether they have the experience, skills, and knowledge to complete the evaluation. If they do not, they must do some research to determine the available resources in their area and refer appropriately. If a funding source such as a Health Maintenance Organization allows only that particular therapist's services, that therapist must educate the funding source. They must also advocate on behalf of the consumer such that the consumer receives an appropriate evaluation by a therapist trained in the area of seating and mobility.

"Experience is, first of all, doing something; second, doing something that makes a difference; third, knowing what differences it makes"(Lindeman, 1961, p. 87). Those therapists who specialize in seating and mobility also have a responsibility. They must recognize best practices in the field and follow them. They must keep their skills and knowledge in all areas of seating and mobility current. However, as experienced clinicians, they should also be willing to share their skills and knowledge with others. This sharing can be done in a variety of ways. Some examples include offering continuing education to other therapists, speaking at various professional organizational meetings, and mentoring other less experienced therapists. Experienced therapists should also consider ways to broaden there services both in metropolitan areas and in rural areas through clinics and possibly mobile satellite clinics. Many of the therapists have developed ways to capture their experiences permanently such as through personal documentation and photographs. These therapists should consider publishing this information and making this wonderful resource available to others. They must also recognize that they may have some areas in which they are lacking skills knowledge and experience. Therefore, if a

consumer is referred to them for a seating and mobility evaluation in an area in which they are inexperienced, they should research their resources and refer this consumer appropriately. The seating and mobility specialists also have research responsibilities.

The field of seating and mobility is wide open for research endeavors. Many of the manufacturers of specific wheelchair products do in-house research in an effort to better market their specific products. For instance, they crash test specific wheelchair frames to determine the frame strength should it be in a car accident. However, little research has been done on the long-term effects of proper seating and positioning for the consumer. Actual quantitative research is also lacking on the long-term functional effects of proper seating and positioning. Research has not been done comparing the effects of one product or wheelchair to another. Research also needs to be completed on the consumer's perspective. For instance research should evaluate the consumer's satisfaction level, things they would like to see done differently, and suggestions they would make. The occupational or physical therapist should play a major role in these research endeavors.

Professional Organizations

Professional organizations have a number of responsibilities to insure that best practices are implemented. The need for credentialing, certification, or an advanced certification for seating and positioning specialists needs to be thoroughly explored. One of the experts in the study also suggested a "triage" model of practice. In this model, a filtering system would be developed to determine whether a full-blown seating and mobility evaluation would need to be completed by a specialist or whether an individual's needs could be met by a generalist.

Professional associations should also be involved at a political level. They should lobby the legislators to create the laws that govern funding. They should also educate funding sources about the need for a requirement that anyone doing seating and mobility evaluation's should meet some sort of minimal criteria. They should support research efforts so that the best possible products and services continue to be developed and delivered to the consumer. Education should be developed for those therapists wishing to specialize in seating and mobility. This education should be developed at a university level, through

professional organizations, and at a privately. Therapists wishing to specialize in seating and mobility should have the opportunity to receive some of this training at a university level. This training should also be offered on an ongoing basis by the private sector. Training should focus around those areas which have been identified as skills and knowledge that are needed for the implementation of best practices. Training on current technology such as pressure mapping, computer-aided design and computer-aided manufacturing could be offered.

Therapists who are experienced in the field might also want to consider offering their services as mentors to the less experienced therapists. Training should also be guided by the knowledge gained through research endeavors.

Funding and the Consumer

Medicaid and Medicare funding is determined and dictated by legislatures. The laws which govern insurance companies are also affected by the legislative decision-making process. The misuse of funding may occur when therapists lacking in experience in seating and mobility do not have a good understanding of the spectrum of equipment that is available nor of the hierarchy of equipment options. The laws should be written such that criteria must be met in

order for a person to be paid for seating and mobility services.

Money is power. Funding sources should take responsibility in protecting the consumer and the public. The consumer needs protection from being evaluated by someone who is not competent to complete the evaluation. Prior to adding a therapist to the funding provider list, the insurance company should check to make sure that the therapist is adequately trained to provide the service. The public should be protected in such a way that they are not paying for poor or inadequate services. Everyone pays for medical and health services whether it be through taxes or through private funds. Poor and inadequate services are costly in both time and financial resources.

The consumer is most affected by the utilization of best practices in a seating and mobility evaluation or the lack of best practices in a seating and mobility evaluation. The consumers can also lobby and fight to make sure that they are evaluated by competent therapists. Taking an active role in the seating and mobility process puts the consumer back in the driver's seat. The consumers and their families can advocate both for themselves and for others. Consumers know best their wants and needs. It is up to the consumers to communicate this information during the evaluation

process. The consumers may also have experiences with different durable medical equipment dealers and therapists during the evaluation process. They can advocate for and support those people or businesses that meet their needs. They can also let others know of situations in which their needs were not met for example, they can do this through the Better Business Bureau.

Summary

This research study describes best practices in the field of seating and mobility as perceived by Occupational and Physical Therapists who are considered experts in the field. Current Best practices in the area of seating and mobility include experience, hands on techniques, skills, technology, resources, self-directed learning, and the consumer. Barriers may exist that have the potential to interfere with the implementation of a thorough seating and mobility evaluation, however, these barriers can also be overcome. The metaphor of the wheel is used to represent these results. The hub of the wheel represents best practices. All of the identified concepts which must be in place are represented by the spokes which must all be present in order for the wheel to work. The barriers to best practices are represented by the brake. This brake can be controlled, however, such that it is not a barrier. A

wheel is made to move. In order to get this wheel rolling, the information and knowledge gained through this research must be applied to practice. It is the responsibility of the therapists, consumers, professional organizations, researchers and the government to assure that best practices are implemented and that the wheel continues to move forward both today and in the future.

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Appendix

Round 1 Questionnaire

**Best Practices by Occupational and Physical
Therapists Performing Seating and Mobility Evaluations**

Directions: Use the TAB key to move from one item to the next. Please feel free to share examples and as much detail as you would like.

1. Think back to a time when you had to solve a difficult seating and positioning problem.
 - A. What skills or tools did you use to evaluate that client?
 - B. What skills and knowledge did you draw from to make decisions and formulate a plan for that client?
 - C. Do you know if your plan did or did not work?
 - D. How did you find out?
2. Think about a time when a client evaluation did not go well.
 - A. Looking back, what skills and knowledge were you missing?
 - B. What would you have done differently?
3. Look back at your early years as a seating and mobility therapist and compare yourself then to now.
 - A. What things have you changed? For example, what are you currently doing differently?
 - B. What motivated you to make this change?
4. What methods did you use to gain your skills and knowledge to complete a successful seating and mobility evaluation?
5. What barriers or potential barriers exist that may prevent you from completing a thorough seating and mobility evaluation?
6. The field of technology is in a constant state of change. List the types of knowledge and skills that you think people in the field will need in the next five years?
7. Many general practitioners are asked to complete seating and mobility evaluations. What knowledge or skills do

you feel that they might be missing to perform these evaluations?

8. From your personal experience, what is the most important thing that interacting with client(s) has taught you?

About You

Name:

Address:

City: , State: Zip Code:

Day Time Phone Number:

Evening Phone Number:

E-Mail Address:

What client population(s) do you primarily serve?

What is your current role as a seating and mobility specialist (for example supplier, evaluator, or general therapist)?

Current Job and Title:

Profession:

Number of Years in Profession:

Number of recent consecutive years where at least 50% of your time has been spent specializing in seating and mobility:

Specialty Certifications for example RESNA certifications:

DISCLAIMER: Anonymity is a necessary component of this research project. We all know how small the "therapy" world can be. I must therefore ask that you agree to not discuss this project with other practitioners until its completion.

By participating in this research project, I am agreeing not to discuss it with others until its completion.

Please save under your last name and return to me at mary-isaacson@ouhsc.edu

Round 2 Questionnaire

Best Practices by Occupational and Physical Therapists Performing Seating and Mobility Evaluations

--Round Two--

Directions: The data from round one of this study was analyzed and compared to determine similarities and differences and to find patterns among all of the participants. The following questions are based on the information that you provide in the first round. Use the TAB key to move from one item to the next. Please feel free to share examples and as much detail as you would like. Please save under your name and return to me.

Your Name:

1. All research participants identified the importance of the consumer's active participation in a seating and mobility evaluation as "a must". More specifically therapists need to listen, be open to interactions, and recognize that the consumers knows more about themselves than the therapist does. Please give an example of how you do this. In this example, describe how you encourage ongoing participation by the consumers you serve and how it has made a difference in your practice.

2. A thorough and complete interview has been identified as an important component of the evaluation process. Please identify what information you gather during the interview process.

3. Several technical skills and knowledge were consistently identified as important components in a seating and mobility evaluation. However, time restraints were listed consistently as barriers to the completion of a thorough seating and mobility assessment. Please rank the necessity of the following components in a seating and mobility evaluation using the scale of:

- 5 = Very Important
- 4 = Important
- 3 = Somewhat Important
- 2 = Unimportant
- 1 = Totally Unimportant

- Mat examination
- Simulation with Simulator
- Pressure Mapping
- Environmental (Home/Work) Assessment
- Trial of recommended equipment
- Movement Assessment

Other:

Other:

4. The ability to complete a thorough seating and mobility evaluation requires a combination of: (a) sound technical knowledge (for example, how to complete a mat assessment); (b) knowledge of the biomechanics of seating and the seated posture; (c) knowledge of the current available seating and positioning equipment available; (d) knowledge from past experiences; and (e) the ability to listen to consumer's needs yet set realistic, functional outcomes.

4a. Please describe how you are able to address all these areas during your evaluations .

4b. Please provide a specific example or detailed information to show how you addressed each of the following:

- a. sound technical knowledge
- b. knowledge of the biomechanics of seating and the seated posture
- c. knowledge of the current available seating and positioning equipment available
- d. knowledge from past experiences
- e. the ability to listen to consumer's needs yet set realistic, functional outcomes

5. Follow-up, both formal and informal, was identified as the primary method for determining whether a prescribed seating system "worked" for a consumer.

- a. Describe a successful example of how you used formal follow-up to determine whether the needs of your consumer were met .
- b. Describe a successful example of how you used informal follow-up to determine whether the needs of your consumer were met .
- c. Please identify which method provided you with the most useful information
- d. Please identify when follow-up should be initiated
- e. If other was identified, please elaborate

6. The participants of this research study identified the following as key components of a successful seating evaluation: (a) Knowledge of current available equipment and technology; (b) sensitivity to consumer needs and desires; (c) the ability to complete a thorough clinical assessment in relation to seating and mobility; and (d) experienced, clinical reasoning/decision making skills. Yet, general practitioners or rehabilitation suppliers are still often called upon to evaluate and make recommendations in the area of seating and mobility.

- a. In your opinion, does this pose a risk to the consumer?
- b. If you answered yes to the above question, what do you see as a viable solution to the problem?

7. The following were most consistently identified as methods utilized for gaining skills and knowledge to complete successful seating and mobility evaluations: (a) Experience, (b) continuing education courses, (c) peer mentoring, (d) trial and error, (e) reading, and (f) trade shows.

- a. Rank these six methods according to the frequency with which you use them. Rank the method you have utilized most frequently as 1 and which method you have used least frequently as 6. Put either the letter or the name of the method below; for example, if you most frequently used method is reading, for 1 you could enter either "e" or "reading".

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.

- b. Now rate how beneficial these learning opportunities have been to you in your practice utilizing the following scale:

5=Very beneficial

4=Beneficial

3=Somewhat beneficial

2=Not beneficial

1=Will never use again

(a) Experience

(b) Continuing education courses

- (c) Peer mentoring
- (d) Trial and error
- (e) Reading
- (f) Trade shows

8. The following were all identified by the majority as the primary barriers for a successful seating and mobility evaluation: (a) Time restraints, (b) limited funding, (c) the unavailability of equipment for trials, and (d) limited access to complete an environmental assessment. Please explain and give some examples of how you overcome these barriers.

- (a) Time restraints
- (b) Limited funding
- (c) Unavailability of equipment for trials
- (d) Limited access to complete an environmental assessment

--Thank You--

Round 1 Letter

Dear Research Participant,

You have been asked to participate in this study in an effort to determine what current leaders in the field of seating and mobility perceive to be best practices. Research will be conducted through the Internet. The Delphi research technique will be utilized for data collection. You will be asked to independently respond to several questions on the attached survey and then return the survey to me. This information will then be tabulated and summarized and returned back to you for further quick dialogue and responses by you. This process may be repeated approximately 2 times until final data reflects a consensus of thoughts and opinions among all the participants. The three things that distinguish this data collection method from others include anonymity with other participants, interaction with controlled feedback, and group response. Because of this, I must ask that you do not discuss this research with anyone else until the project is totally completed, and that you respond as thoroughly and quickly as possible. The deadline for return of this round of data is April 1. If you should have any questions, please direct them to me at:

Mary Isaacson, MA, OTR/L, ATP
Tulsa, Oklahoma
mary-isaacson@ouhsc.edu

Home: 918 742-6782
Work: 918 660-3272

Round 2 Letter

Dear

Thank you for your responses in Round 1 of this research project. I must say that your enthusiasm and sincerity for the subject placed me on Cloud 9. As I mentioned before, I am utilizing the Delphi Technique which means that information is gathered from you the experts. I then ask you a second round of questions, and if needed, a third or fourth round of questions in an effort to find a consensus among the group. Thank you for your time and effort. As before, after answering the questions, please save under your last name-round 2 and send back to me. The deadline for this round is May 12th. If you have any questions please do not hesitate to contact me.

Oklahoma State University
Institutional Review Board

Protocol Expires: 1/26/2004

Date: Monday, January 27, 2003

IRB Application No ED0368

Proposal Title: BEST PRACTICES BY OCCUPATIONAL AND PHYSICAL THERAPISTS PERFORMING
WHEELCHAIR ASSESSMENTS

Principal
Investigator(s):

Mary Isaacson
3705 E 39
Tulsa, OK 74135

Gary Conti
206 Willard
Stillwater, OK 74078

Reviewed and
Processed as: Exempt

Approval Status Recommended by Reviewer(s): Approved

Dear PI :

Your IRB application referenced above has been approved for one calendar year. Please make note of the expiration date indicated above. It is the judgment of the reviewers that the rights and welfare of individuals who may be asked to participate in this study will be respected, and that the research will be conducted in a manner consistent with the IRB requirements as outlined in section 45 CFR 46.

As Principal Investigator, it is your responsibility to do the following:

1. Conduct this study exactly as it has been approved. Any modifications to the research protocol must be submitted with the appropriate signatures for IRB approval.
2. Submit a request for continuation if the study extends beyond the approval period of one calendar year. This continuation must receive IRB review and approval before the research can continue.
3. Report any adverse events to the IRB Chair promptly. Adverse events are those which are unanticipated and impact the subjects during the course of this research; and
4. Notify the IRB office in writing when your research project is complete.

Please note that approved projects are subject to monitoring by the IRB. If you have questions about the IRB procedures or need any assistance from the Board, please contact Sharon Bacher, the Executive Secretary to the IRB, in 415 Whitehurst (phone: 405-744-5700, sbacher@okstate.edu).

Sincerely,



Carol Olson, Chair
Institutional Review Board

VITA 2

Mary K. Isaacson

Doctor of Education

Thesis: BEST PRACTICES BY OCCUPATIONAL AND PHYSICAL
THERAPISTS PERFORMING SEATING AND
MOBILITY EVALUATIONS

Major Field: Occupational and Adult Education

Biographical:

Education: Graduated from Edison High School, Tulsa, Oklahoma, May, 1981; received Bachelor of Science degree in Occupational Therapy from the University of Oklahoma Health Sciences Center, Oklahoma City, Oklahoma, May, 1985; received Master of Arts in Occupational Therapy Administration from Texas Women's University, Denton, Texas, May, 1991. Began doctoral work August 2000. Completed the requirements for the Doctor of Education degree at Oklahoma State University, Stillwater, Oklahoma in July 2003.

Experience: Staff Occupational Therapist, West Texas Rehabilitation Center, 1985-1988. Chief Occupational Therapist, West Texas Rehabilitation Center, 1998-1990. Occupational Therapist, Columbus Medical Services, Inc, 1991-1992. Chief Executive Officer and owner, Adaptabilities Inc. 1992-present. Adjunct Assistant Professor, University of Oklahoma Health Sciences Center, 2002-present.

Professional Memberships: American Occupational Therapy Association, Oklahoma Occupational Therapy Association, Rehabilitation Society of North America.