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Occupational therapy for function in self-care following cerebrovascular accident : is there increased function?

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OCCUPATIONAL THERAPY FOR FUNCTION IN SELF-CARE FOLLOWING CEREBROVASCULAR ACCIDENT: IS THERE INCREASED FUNCTION?

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ABSTRACT

Self-care as a treatment intervention has a strong traditional base in occupational therapy for persons who have sustained a cerebrovascular accident (CVA). Few studies have been conducted on its effectiveness, despite the controversy over the cost-effectiveness of rehabilitation in treating persons with CVA, and despite the changing climate of reimbursement in health care.

The subjects in this retrospective study included 83 patients who had sustained CVAs and had been admitted to Rhode Island Hospital's rehabilitation unit for therapy that included self-care treatment. Forty-six percent sustained left hemisphere CVAs and forty-two percent sustained right hemisphere CVAs. The median age span was 76 to 85 years. The median hours of treatment in self-care were 6.9 (SD$\pm$3.8). The median length of stay was 18.6 days (SD$\pm$6.6). Thirty-two percent of the subjects were admitted with severe functional impairment, 27% were admitted with moderate functional impairments, and 41% were admitted with mild functional impairments.

Ninety-three percent of the subjects showed some measure of functional improvement on the Functional Independence Measure (FIM). The mean amount of improvement

was 3.7 ($\underline{SD}^{\pm}$2.9) total FIM points calculated as the difference between admission and discharge scores for grooming, bathing, upper body dressing, lower body dressing, and toilet transfers.

Strong significant correlation was found between cognitive level when admitted and increase in self-care scores ($\underline{p}$=.005). Significant correlation was found between age and increase in overall self-care score ($\underline{p}$=.03).

No correlation was found between hours of treatment, length of stay, level of severity, number of complicating diagnoses, or side of lesion, and increase in the self-care skills scores.

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CHAPTER 1

INTRODUCTION

Purpose

The purpose of this study was to determine the extent to which change occurs in functional deficits sustained by patients with cerebrovascular accident following occupational therapy.

Statement of the Problem

Occupational therapy is based on the premise that through purposeful activity human beings can influence the state of their body and mind. This founding premise has face validity, but the body of research backing this belief is small.

Additionally, there is ongoing competition among health care professions for reimbursement funds. As inflation escalates, regulations required for reimbursement become stricter and payment less automatic. It becomes more pressing with each passing year to provide data that show the cost-effectiveness of each health care service.

Health care today is being driven by reimbursement. Most health care professionals are motivated by genuine concern for their patients and deliver services of high

quality. However, the current health care climate is inundated with documentation requirements for reimbursement. This documentation is designed by or for reimbursement agencies to analyze the quality of care and significance of functional improvement.

The recent concerns regarding reimbursement and quality of services in health care were spearheaded by the 1983 Medical Prospective Payment System (PPS), which was active nationwide by 1988 (Mayer-Oakes, Oye, Leake, & Brooks, 1988). Previously, hospitals were paid after the patient was discharged for the estimated worth of services rendered. Under the new system, hospitals are paid a fixed amount based on the admission diagnosis (Heinemann, Billeter, & Betts, 1988). If the patient recovers before that fixed dollar amount is completely used, the hospital profits. If, however, the patient recovers after the fixed dollar amount is completely used, the hospital loses money. Since Medicare payments represent nearly 50% (Wallace, 1988) of the revenue earned by a typical rehabilitation provider, the push to cut costs and hasten recovery is considerable.

One of the few specialized acute care hospital services currently exempt from Medicare's PPS and their diagnostic related groups (DRGs) is the rehabilitation unit. Even on these units, however, the demand for documentation reflecting "significant practical" improvement (Blue Cross

and Blue Shield of Rhode Island, 1988) is high. Medicare, and the major health care providers who follow Medicare's lead, scrutinize the quality of care and adherence to established guidelines regarding significance of improvement. On these specialized units, provision of occupational therapy and physical therapy is required for reimbursement. Of concern is the probability that a PPS-like system will govern the reimbursement of occupational and physical therapy in the near future (Batavia, & DeJong, 1988; Carey, Seibert, & Posavac, 1987; Heinemann, et al., 1988; Johnson & Keith, 1983).

From a fiscal standpoint, the role of occupational therapy services in the financial performance of hospitals and rehabilitation units may change with the implementation of a prospective payment system. Under the retrospective payment system, occupational therapy was a revenue generating service because all treatments were reimbursed on a cost basis. Under a prospective payment system, occupational therapy has the potential to be considered revenue depleting because payment will be based on perceived value (Holden & Daniele, 1987).

The current emphasis on controlling costs, decreasing lengths of stay, and eliminating the need for more costly health care support services challenges the profession to demonstrate that occupational therapy is indeed a cost-

effective and necessary service. This study will provide data and raise further questions about the factors that influence outcomes in self-care function in people disabled by cerebrovascular accident.

Objective and Questions

Objective

The main objective of this study was to determine the outcomes of occupational therapy intervention on self-care independence in a population of patients in the acute rehabilitation environment who have survived cerebrovascular accident.

Questions:

The questions generated for this study were:

1. Does occupational therapy documentation on the Functional Independence Measure (Appendices A and B) show an increase in independence of overall self-care skills and self-care skills in the areas of grooming, bathing, upper body dressing, lower body dressing and toilet transfer behavior following occupational therapy for these functions in patients who have been disabled by cerebrovascular accident?

2. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing,

upper body dressing, lower body dressing, toilet transfers) and time spent in self-care intervention provided by the occupational therapist for persons who have sustained a cerebrovascular accident?

3. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and hemisphere of lesion in those persons who have sustained a cerebrovascular accident and have been treated in occupational therapy for self-care function?

4. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and age in those persons who have sustained a cerebrovascular accident and have been treated in occupational therapy for self-care function?

5. Is there a significant relationship between the change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and severity of dysfunction at the time the patient was admitted to the rehabilitation unit?

6. What is the relationship between discharge level of self-care and discharge placement (home, nursing home, rehabilitation facility)?

Definition of Terms

For the purposes of this study, terms have been defined as follows:

Bathing is washing the body from the neck down (tub, shower, or bed bath). Complete independence is considered the ability to bathe and dry the body from the neck down. This was given a Functional Independence Measure (FIM) score of 4.0.

Modified independence is the ability to bathe and dry the body from the neck down but requires adaptive or assistive devices, takes more than a reasonable amount of time, or needs supervision because of safety considerations; scored as 3.0.

Modified dependence in bathing requires supervision (standby assistance, cuing, or coaxing), scored as 2.0, and/or minimal (scored as 1.7) or moderate (scored as 1.3) assistance during washing and drying.

Complete dependence requires maximal (scored as 1.0) or total (scored as 0.5) assistance to bathe and dry (Granger, Hamilton, & Sherwin, 1986).

Cerebrovascular Accident (CVA, stroke) is the sudden onset of a focal neurologic deficit due to presumed local disturbance in blood supply to the brain (Dombovy, Sandok, & Basford, 1986).

Cognition includes skills related to 1) social

interaction (getting along and participating with others in therapeutic and social situations), 2) problem solving (using previously acquired knowledge to solve problems of daily living), and 3) memory (awareness in performing daily activities in an institutional or community setting).

Complete independence is considered 1) the ability to use social interaction skills to participate appropriately with staff, other patients, and family members including controlling temper, accepting criticism, and an awareness that actions and words have an impact on others, 2) the ability to use problem solving skills in new or unfamiliar situations by applying previously acquired knowledge to initiate and complete a sequence of steps independently including self-correction if errors are made, and 3) the ability to use memory to recognize people frequently encountered, remember daily routines without cuing, and to execute directions without the need for repetition. These were given FIM scores of 4.0.

Modified independence is 1) social interaction skills adequate to participate with staff other patients and family members in structured situations, 2) problem solving skills that make initiating, sequencing, or self-correcting difficult, and 3) memory skills that make recognition of others and remembering daily routines difficult, but that

are adequate when using environmental cues; scored as 3.0 on the FIM scale.

Modified dependence is 1) social interaction skills that require supervision less than 50% of the time due to unpredictable or uncooperative behavior, 2) problem solving skills that require supervision of another person less than 50% of the time to initiate or sequence activities, and 3) memory skills that require prompting by others less than 50% of the time to recognize others, recall daily routines and requests of others; scored as 2.0 on the FIM scale.

Complete dependence is 1) social skills that require supervision more than 50% of the time due to socially unacceptable behavior, 2) problem solving skills that require supervision more than 50% of the time to initiate and sequence activities, and 3) memory skills that require cuing or prompting more than 50% of the time to recognize others and recall daily routines and directions. These were scored as 1.0 on the FIM scale (Granger, Hamilton, & Sherwin, 1986).

Documentation is the recording of scores on the Functional Independence Measure scoring sheet which is updated weekly by occupational therapists in the areas of grooming, bathing, upper body dressing, lower body dressing and toileting. These are noted both numerically and in bar graph form (Appendix B).

Grooming includes oral care, hair grooming, washing hands and face and either shaving or applying make-up.

Complete independence is achieved when a patient cleans teeth or dentures, combs or brushes hair, washes hands and face, shaves, applies make-up, and performs grooming activities safely in a reasonable period of time including all preparation; scored as 4.0.

Modified independence is as above but requires prior preparation, adaptive or assistive devices, or takes more than a reasonable time; scored as 3.0.

Modified dependence requires supervision (e.g., standby, cuing, or coaxing), scored as 2.0, and/or minimal (scored as 1.7) or moderate (scored as 1.3) assistance during grooming activities.

Complete dependence requires maximal (scored as 1.0) or total (scored as 0.5) assistance or grooming is not performed (Granger, Hamilton & Sherwin, 1986).

Lower body dressing includes dressing from the waist down as well as donning or removing a prosthesis or orthosis when applicable.

Complete independence is achieved as in upper body dressing. This includes managing underpants, slacks, skirts, belts, stockings and shoes; scored as 4.0.

Other levels are the same as is described under upper body dressing (Granger, Hamilton, & Sherwin, 1986).

Self-care skills scores are the level of independence in grooming, bathing, upper body dressing, lower body dressing and toilet transfers designated numerically on the Functional Independence Measure. Higher scores denote greater independence.

Self-care treatment is the intervention program provided by registered and licensed occupational therapists in grooming, bathing, upper body dressing, lower body dressing and toilet transfers that has been graded for each patient to meet the level of assistance required. The program is modified on a weekly basis in response to patient progress.

Severity of dysfunction is measured by 1) the level of assistance required to complete grooming, bathing, upper body dressing, lower body dressing, and toilet transfers, and 2) the number of complicating diagnoses other than CVA listed on the medical records data printout.

Mild dysfunction is defined as no more than 2 scores below 1.7 on the FIM scale (Appendix A and B).

Moderate dysfunction is defined as no more than 2 scores below 1.3 on the FIM scale.

Severe dysfunction is defined as no more than 2 scores above 1.0 on the FIM scale.

The more complicating diagnoses a subject has, the greater effect there is on severity of dysfunction. Zero

complicating diagnoses is considered to have no effect on function. Five complicating diagnoses are considered to have a substantial effect on function.

Toilet transfers include getting on and off a toilet.

Complete independence, if walking, includes the ability to approach, sit down on, and get up from a standard toilet safely.

Complete independence from a wheelchair includes the ability to approach a toilet, lock the brakes, lift the foot rests, and safely perform either a standing pivot or a sliding transfer safely to and from the toilet; scored as 4.0.

Modified independence is as outlined above but requiring adaptive or assistive devices such as a sliding board, a lift, grab bars, or a special seat; or takes more than a reasonable amount of time to complete a transfer or a transfer is not performed safely. The assistance of another person is not required at this level; scored as 3.0.

Modified dependence is when supervision, in the form of standby, cuing or coaxing is needed (scored as 2.0) and/or minimal assistance (scored as 1.7) to moderate assistance (scored as 1.3) is required.

Complete dependence is scored when maximal (scored as 1.0) or total (scored as 0.5) assistance is needed or the transfer cannot be performed (Granger, Hamilton, & Sherwin,

(1986).

Upper body dressing includes dressing from the waist up, as well as donning or removing prostheses or orthoses when applicable.

Complete independence includes dressing, undressing, and obtaining clothes from customary places such as drawers and closets. Performance should include the ability to manage bras, pull-over, and front-opening garments as well as ability to use zippers, buttons and snaps; scored as 4.0.

Modified independence is as above, but requires retrieval or arrangement of clothes before dressing, or use of special adaptive closures/assistive devices, or taking more than a reasonable time; scored as 3.0.

Modified dependence is when a patient requires supervision (standby, cuing, or coaxing), scored as 2.0, and/or minimal (scored as 1.7) to moderate (scored as 1.3) assistance during dressing.

Complete dependence is when maximal (scored as 1.0) or total (scored as 0.5) assistance is required (Granger, Hamilton, & Sherwin, 1986).

Assumptions

The assumptions held by the researcher were:

1. The patients were accurately diagnosed with cerebrovascular accident.

2. Selection of patients for admission to the rehabilitation unit at Rhode Island Hospital was equitably biased or selective.

3. All patients participated in the therapeutic program to the best of their abilities.

4. All patients received a self-care treatment program that equitably identified and addressed their needs.

5. The protocol for evaluating level of self-care was followed as outlined in the Functional Independence Measure.

6. Biased or selective documentation of self-care activity was equitably distributed among the selected population.

7. The scores received by patients in self-care function were reliable and valid indicators of their grooming, bathing, upper body dressing, lower body dressing, and toilet transfer independence.

8. The clinical observations and interactions used to measure grooming, bathing, upper body dressing, lower body dressing, and toilet transfer independence were reliable and valid indicators of self-care independence in hospital and home environments.

Limitations

The limitations of this study were:

1. The subjects were not randomly chosen from the

population.

2. No control group was obtained for this study. There were two reasons for this omission. The first was that a control group in this study would inherently be one in which potentially valuable therapy would be withheld. The condition, under the circumstances, could not be justified. The second was that very few patients admitted to Rhode Island Hospital with a diagnosis of cerebrovascular accident are discharged without occupational and physical therapy. Those who are, usually fall at the extreme ends of the continuum in regard to level of impairment (mild or severe), and therefore would be difficult to match with an experimental group. Additionally, this was a retrospective study, and patients who were not seen for occupational therapy did not have documentation on self-care performance in their records.

3. Occupational therapy was always provided in conjunction with at least two other therapeutic services (physical therapy and rehabilitation nursing), and frequently in conjunction with several other therapeutic services (neuropsychology, speech therapy, vocational counseling, specialist nursing, and social work). The combined effect of these interventions on self-care function could not be separated out of the research data.

4. The effect of patient personality, cultural

background, age, intelligence, sex, occupation, education, socioeconomic status, and support from significant others on changes in self-care scores could not be assessed by the research data.

5. The effect of therapist education, experience, personality, values, and treatment style on changes in self-care scores could not be assessed by the research data.

Significance of the Study

There were two significant reasons for this study to be conducted. The first was the need to determine whether data, which supports the belief that functional improvement is achieved in a program of occupational therapy, could be generated for a specific diagnostic group of physically challenged individuals. The second was the presence of a constantly decreasing funding structure for all areas of health care which creates the need for occupational therapy to determine whether its services are necessary and cost-effective.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

The literature significant to this study included the theoretical frame of reference, changes in reimbursement for health care services including the prospective payment system, the effectiveness of therapeutic intervention on function in persons with cerebrovascular accident, and self-care as a treatment modality in occupational therapy. The literature is reported in that order.

Theoretical Frame of Reference

Theory

Cerebrovascular accident (CVA) is the "sudden onset of a focal neurologic deficit due to presumed local disturbance in the blood supply" (Dombovy, Sandok, & Basford, 1986, p. 363). Recent studies suggest that between one-fourth and one-third of all patients who survive after sustaining a cerebrovascular accident experience persistent dependence in one or more areas of self-care (Silliman, Wagner & Fletcher, 1987).

When occupational therapists are engaged in the self-

care treatment of a person who has experienced CVA, they use the familiar repetitive activities of bathing and dressing to positively influence the physical, perceptual, sensory, and cognitive systems. Treatment theories in this area are primarily based in two bodies of knowledge: activities theory and neurophysiology.

Activities theory states that "abilities are converted into skills through practice" (Rogers, 1984, p. 47). Moore (1980) added that:

> Active involvement has repeatedly been shown to be superior to passive participation or observation in order for a nervous system to learn, mature, and remain viable. A person needs to get "into the act" and go through the process of an activity before permanent memory engrams are laid down. The aim of therapy is that the patient should learn, and learning takes place through repeated experience with the environment (p. 63).

Neurophysiology theory concerns the interconnectedness of the physical, perceptual, sensory, and cognitive systems in the human body.

In her historical perspective of recovery potentials following central nervous system lesion, Moore (1986) reports on the new technological advances that have made studying central nervous system pathways possible. These

new studies lend support to the theory that alternate brain pathways, collateralizing pathways, and parallel pathways are all matured in the damaged brain through "repeated meaningful and purposeful use" (Moore, 1986, p. 461).

Bach-y-Rita (1981) wrote that "it is now clear that neuronal and dendritic growth results from functional demands. This growth is eventually accompanied by new synapse formation" (p. 76). He believes that the plasticity of the brain is fully capable of mediating recovery of function. He stated that "Brain plasticity is a basis of the development of rehabilitation procedures for hemiplegia" (p. 80).

Experiments continue to support central nervous system healing through a combination of tactile and kinesthetic treatment, often called guiding, which is frequently a significant part of self-care treatment in cerebrovascular accident. Affolter (1981) is quoted as saying that:

> By taking the hands or the body of the patient and by guiding them to explore stimuli of the situation, some input can be assured. In addition to allowing input, the tactile-kinesthetic system is unique among the sensory systems because it is the only sensory system that relates directly to reality. Looking at the world, nothing will be changed. Listening to the world, again, the world will not be changed. However,

> the world cannot be touched without some changes. The tactile-kinesthetic system combines receiving and exploratory functions, perceptual and motor processes. Developmentally, processing of tactile-kinesthetic cause-effect information can be considered to be fundamental for building up cognitive and emotional experience (p. 4).

These theories lend support to the assumption that active involvement through the vehicle of self-care activities can influence the neurophysiologic system disabled by CVA and promote functional recovery.

Frames of Reference

The occupational therapy frames of reference that utilize the above concepts are occupational performance and occupational behavior.

Occupational performance is:

> ...the individual's ability to accomplish the tasks required by his or her role and related to his or her developmental stage. Roles include those of a "preschooler", student, homemaker, employee, and retired worker. Occupational performance includes self-care, work, and play/leisure time performance. (American Occupational Therapy Association cited in Pedretti, 1985, p. 1)

The ability to perform the occupational tasks listed above is significantly influenced by "(1) sensory - integrative functioning, (2) motor functioning, (3) social functioning, (4) psychological functioning, and (5) cognitive functioning" (American Occupational Therapy Association cited in Pedretti, 1985, p. 1). These are called performance components and are:

> the learned developmental patterns of behavior which are the substructures and foundation of the individual's occupational performance.... In this frame of reference the concerns of occupational therapy are the performance skills (self-care, work, and, play and leisure activities) and the performance components that enable performance skills. (American Occupational Therapy Association cited in Pedretti, 1985, p. 1)

The occupational behavior frame of reference views the:

> normal human being (and therefore by implication the disabled human being) [as] always characterized by the presence of effectance motivation.... Effectance (or intrinsic) motivation is defined by a biologically inherent or innate urge to explore and master the environment.... Effectance motivation offers an explanation for participation in such non-tension-reducing behaviors as rule and skill acquisition,

habit formation and goal setting, all of which make up ADL, leisure, and work (Sharrott, & Cooper-Fraps, 1986, p. 249).

These two frames of reference identify self-care as a purposeful activity and as an occupational role that human beings are inherently motivated to master. They identify the realm of self-care intervention as part of the domain of practice for the profession of occupational therapy.

Reimbursement

Studies predicting the effects that the Medicare Prospective Payment system will have on health care abound. This study reviews literature specifically concerned with the PPS and its effect on rehabilitation services.

There is controversy regarding the effect of the PPS and DRGs on patient care. Fitzgerald, Moore, and Dittus (1988) studied the effect of DRGs on hip fracture patients. Heinemann et al. (1988) studied changes on rehabilitation units since the implementation of DRGs as they were perceived by rehabilitation professionals. Both found evidence that readmissions due to complications soon after discharge have increased, and that the quality of care, especially for patients needing intense rehabilitation or patient education, has decreased. On the other hand, Mayer-Oakes, Oye, Leake, and Brook (1988) found that in a

medical intensive care unit DRGs seemed to facilitate cost-effectiveness without an increase in morbidity. There is no disagreement, however, about the finding that, with the implementation of DRGs, referrals to rehabilitation were increasing steadily on an annual basis (Dore 1987; Heinemann et al., 1988).

There is also a burgeoning body of literature that focuses on predictions about the type of reimbursement system which will be established by the Department of Human Health Services for the acute care rehabilitation units that are currently DRG exempt. Batavia and DeJong (1988), Carey et al. (1987), and Johnston and Miller (1986) all predict a new PPS for rehabilitation in the near future. Batavia and DeJong (1988) warn of the dangers of an ill-conceived PPS for rehabilitation that does not clearly define a system for classifying rehabilitation services. Carey et al. (1987) warn that the average length of stay for rehabilitation patients from 1985 to 1986 remained the same while the average charge per day increased 13%. It now costs $19,660 to achieve 20 percentage points of improvement on the activities of daily living (ADL) scale compared to $17,260 in 1985. "If rehabilitation facilities are unable to demonstrate adequate functional improvement for resources consumed, they can expect the government to intervene" (Carey et al., p. 70).

Without exception, the occupational therapy literature focusing on reimbursement in the face of a prospective payment system warns that the profession must show that occupational therapy significantly increases a patient's level of function in a cost-effective manner (Baum, 1985; DePaoli & Zenk-Jones, 1984; Kautzman, 1986; and Scott, 1984).

According to several authors, implications for occupational therapy include greater emphasis on reducing hospital length of stay, documentation and accounting that are compatible with computer data systems, and therapy that produces functional outcomes as opposed to just increases in strength, range of motion, coordination, sensation, or memory (Blue Cross and Blue Shield of Rhode Island, 1988; Kautzman, 1986; and Scott, 1984). All agree that the prospective payment system is an idea whose time has come. Hospitals, whether profit or non-profit, will be infinitely concerned with the cost of anything provided to the patients. Baum (1985) points out that since nearly 50% of occupational therapy practitioners work in a hospital based practice, "we must be prepared for the ramifications of this change" (p. 783).

The Effectiveness of Therapeutic Intervention on Function in the CVA Population

The economic and social impacts of cerebrovascular accident are great. Feigenson (1979) estimated that the cost of care plus the loss of earnings due to stroke in the United States was 7.5 to 11.2 billion dollars per year in the late 1970's. Feigenson, Feigenson, Gitlow, McCarthy, and Greenberg (1978) reported that in New York City alone the initial costs for patients with acute cerebrovascular accident ranged from $13,052 to $19,285 in 1977. Costs for rehabilitation after this acute care ranged from $6,000 to $8,000 (Feigenson et al., 1978). The conclusion of these studies was that rehabilitation was justified if it decreased the number of patients requiring long-term institutional care, which totaled between $18,000 and $36,000 per patient yearly in 1977.

Several studies, including one by Lehmann et al. (1975), suggested that early rehabilitation after stroke decreases long-term social and economic costs. In this particular study, as in several reviewed, no comparison was made to a control group of patients who did not receive early rehabilitation.

The biggest obstacle to comparing studies on stroke rehabilitation is that very few use similar designs making it difficult to combine statistics and draw wide reaching

conclusions. Not only do study designs differ, there is also considerable variety among institutions in their criteria for patient selection, the interval between stroke onset and rehabilitation initiation, the type and duration of therapy provided, and the measurement instrument used.

Although regulations and guidelines developed by Medicare and the Joint Commission on Accreditation of Hospitals are helping to address some of these variations and are reviewing recommendations for uniform evaluation tools (Carey et al., 1987; Wallace, 1988), most of the studies that have been published were carried out before these guidelines were established.

Despite these difficulties, studies by Anderson, Baldridge and Ettinger (1979), Dow, Dick, and Crowell (1974), Feigenson, McCarthy, Greenberg, and Feigenson (1977), Feldman, Lee, Untrecker, Lloyd, Rusk, and Toole (1962), Issacs and Marks (1973), Johnston and Miller (1986), Miglietta, Chung, and Rajeswarmmia (1976), Parfenchuck, Parziale, Liberman, and Butcher (1988), Seitz, Allred, Bakus, and Hoffman (1987), Stern, McDowell, Miller, and Robinson (1971), and Truscott, Kretschmann, Toole, and Pajak (1974), generally conclude that, if improved functional capacity and disposition are used as measures, an organized and comprehensive rehabilitation program is beneficial.

In contrast, Lind (1982) reviewed seven studies of

rehabilitation outcomes for CVA and found that the three studies that quantified improvement found no effect, but the four studies that relied on observation found significant effect. He concluded that rehabilitation has a negligible effect on function in most CVA patients, but that rehabilitation may result in an increase in self-care independence for patients with intermediate levels of function. This gain, he noted, may decrease the amount of nursing care.

Feldman et al. (1962) concluded that the great majority of CVA patients can be rehabilitated adequately on medical and neurological floors if proper attention is given to ambulation and self-care. However, this conclusion was drawn before the establishment of the PPS, which does not provide for reimbursement of ambulation or self-care treatment after a pre-determined number of days have elapsed.

In a more recent study, Smith, Garraway, Smith, and Akhtar (1982) completed a randomized controlled study of 234 CVA patients in Edinburgh, Scotland. Patients with an admitting diagnosis of CVA were randomly assigned to either a stroke unit or a medical ward within a few days after admission. Functional independence was assessed at dismissal and was found to be greater in patients on the stroke unit, despite similar neurologic deficits in the two

groups. This finding suggests that some aspect of the stroke unit, rather than spontaneous recovery alone, was responsible for improvement. The length of hospitalization was shorter for patients in the stroke unit than for those on the medical ward. Patients on the stroke unit received physical therapy earlier, but for a shorter period, and were more likely to receive occupational therapy and to receive it earlier. Other important differences between the stroke unit and the medical unit were the presence of rehabilitation nursing, a team approach, and a functionally oriented atmosphere that may have encouraged patients to take a more active role and practice their skills more consistently.

Recently, in two additional controlled studies (Stevens, Ambler, & Warren, 1984; and Strand, Asplund, Eriksson, Haag, & Lithner, 1985) a comparison was made between the clinical outcomes of patients in a special stroke rehabilitation unit and those who receive therapy on general medical wards. At both 3 and 12 months after stroke, the percentage of patients living at home was greater for the group that received rehabilitation in a specialized setting. However, differences in independence for activities of daily living were small.

As evidenced by this review, numerous studies can be found that support and reject the assumption that

rehabilitation increases functional independence in the CVA population.

Self-Care as a Treatment Modality in Occupational Therapy

Treatment of disabilities in self-care is frequently considered a cornerstone of occupational therapy. In the 1978 edition one of the profession's earliest textbooks, Willard and Spackman's Occupational Therapy, Spencer (1978), states that, "In the rehabilitation process, the patient must be encouraged and allowed to function independently at the level of his or her ability in all areas of activity. . . This approach begins with self-care and ends with vocational independence" (p. 338).

Ironically, published studies exploring the effectiveness of occupational therapy in the treatment of self-care are limited. Of note is a study conducted by Shilliam, Beeman, and Loshen (1983) regarding the effect of occupational therapy on bathing independence. The study was small, examining 19 patients in a non-randomized design from diverse diagnostic categories. There was no control group. The results showed that occupational therapy yielded a significant increase in bathing independence. Though few conclusions can be drawn from such a small population of diverse diagnostic categories, the study identified the need

for research that supports occupational therapy as a cost-effective treatment.

On the other hand, Furst, Gerber, Smith, Fisher, and Shulman (1987) conducted a study on the effect of a program for improving self-care energy conservation behaviors. They used a pre-test, post-test method on a population of clients with rheumatoid arthritis. They found no significant statistical change from this type of occupational therapy intervention on self-care.

A few studies have compared visual or perceptual function to dressing independence (Dudgeon, DeLisa, & Miller, 1984; Warren, 1981). They generally found inverse correlations between dressing independence and the presence of optokinetic nystagamus and constructional apraxia.

Other studies were concerned with predicting self-care independence based on the side of lesion in cerebrovascular accident (Mills & Digenio, 1983; Wade, Hewer, & Wood 1984). These studies were based on relatively large populations of 102 and 162 CVA patients, respectively. Both agreed that, despite expecting to find people who have sustained left hemisphere CVA's less functional than those experiencing right hemisphere CVA's, no significant relationship was found between side of lesion and dressing independence.

No studies were located addressing the effect of a traditional program of graded assisted self-care and its

impact on independence. No studies were found on the effect of occupational therapy intervention on the level of self-care after CVA; a condition which is the major cause of disability in the United States today (Kelly-Hayes, Wolf, Kannel, & Stykowski, 1988).

Summary

Self-care as a treatment modality has a strong traditional base in occupational therapy and is well supported in theory. Few studies have been conducted on its effectiveness with CVA, despite the controversy over the effectiveness of rehabilitation in stroke treatment and despite the changing climate of reimbursement in health care, which will force all health care professions to prove their cost-effectiveness.

CHAPTER 3

DESIGN AND METHODOLOGY

Objective

The primary objective of this study was to determine the outcomes of occupational therapy intervention on self-care independence in a population of patients in the acute rehabilitation environment who have survived a cerebrovascular accident.

Questions

The questions generated for this study were:

1. Does occupational therapy documentation on the Functional Independence Measure (Appendices A and B) show an increase in independence of overall self-care skills and in the self-care skill areas of grooming, bathing, upper body dressing, lower body dressing, and toilet transfer behavior following occupational therapy for these functions in patients disabled by cerebrovascular accident?

2. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and time spent in self-care interventions provided by the occupational therapist for persons who have

sustained a cerebrovascular accident?

3. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and hemisphere of lesion in those persons who have sustained a cerebrovascular accident and have been treated in occupational therapy for self-care function?

4. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and age in those persons who have sustained a cerebrovascular accident and have been treated in occupational therapy for self-care function?

5. Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfers) and severity of dysfunction at the time the patient was admitted to the rehabilitation unit?

6. What is the relationship between discharge level of self-care and discharge placement (home, nursing home, rehabilitation facility)?

Population

The subjects in this study were a delimited population of people diagnosed with cerebrovascular accident who were admitted to Rhode Island Hospital's 8-bed acute

care rehabilitation unit between August 1, 1987 and April 1, 1989. Diagnosis of cerebrovascular accident was decided by diagnosis entered on the rehabilitation consultation form. This was determined by computerized tomography and/or neurological evaluation.

The beginning date for this retrospective chart review, August 1, 1987, coincided with the date that the Functional Independence Measure was established as a regular evaluation tool on the rehabilitation unit. The cut-off date, April 1, 1989, was chosen to permit enough time to obtain a reasonable sample size. All patients admitted between the established dates (20 months) with a diagnosis of CVA, whether primary or secondary, were used for this study.

Random sampling was not used in an effort to maximize sample size, which was necessary to obtain critical values in statistical analysis (Stein, 1980). The sampling was stratified into a group of CVA patients with no secondary diagnosis other than cardiovascular disease, and those with secondary diagnoses that would additionally complicate and slow the return of functional abilities. The final inclusionary criteria were those CVA patients whose occupational therapy program included self-care treatment.

A control group was not established because 1) it would have involved withholding therapy that is believed to

be beneficial, and 2) at Rhode Island Hospital, almost all patients with a diagnosis of CVA are automatically referred to occupational and physical therapy.

Design

The design of this study was ex post facto employing a retrospective chart review. The questions it asked were heuristic in nature (Stein, 1980). Inherent in the nature of this design was an inability to control the variables, which were:

Dependent

- Change in FIM score - grooming
- Change in FIM score - bathing
- Change in FIM score - upper body dressing
- Change in FIM score - lower body dressing
- Change in FIM score - toilet transfers
- Change in FIM score - total

Independent

- Time spent in occupational therapy
  - Hours of self-care treatment.
  - Length of stay on the rehabilitation unit.
- Hemisphere of lesion:
  - Left
  - Right
  - Other

Age:

46 to 55 years

56 to 65 years

66 to 75 years

76 to 85 years

86 to 95 years

Other - older

Other - younger

Severity of dysfunction:

Severe

Moderate

Mild

Number of secondary diagnoses

Cognition score on the FIM when admitted

Discharge Placement:

Home

Nursing Home

Rehabilitation Facility

Other

The independent variables were selected based on variables that the literature identified as affecting improvement in function and discharge placement.

Data Collection

Data collection techniques for this study were as

follows:

Evaluation Instrument

The FIM is used to score all patients on the RIH rehabilitation unit on admission, discharge, and on a weekly basis. All members of the rehabilitation team are responsible for scoring sections of the FIM that correspond to their professional area of expertise. The occupational therapists are responsible for scoring functional status in the areas of grooming, bathing, upper body dressing, lower body dressing, and toilet transfers.

The Functional Independence Measure (FIM) is a uniform data system for medical rehabilitation developed by the Department of Rehabilitation Medicine at the State University of New York at Buffalo in 1986 (Appendix A). The project was undertaken to meet a long-standing need to document severity of patient disability and the outcomes of medical rehabilitation.

The FIM was developed with support from the U.S. Department of Education and the National Institute of Handicapped Research. It has been recommended and accepted for review by the Department of Health and Human Services for consideration as an instrument to determine levels of disability when a prospective payment system is developed for rehabilitation (Wallace, 1988).

Interrater reliability, validity, precision, and time to complete the assessment were evaluated by the FIM development team. Eight-hundred and ninety-one assessments were performed on 250 patients in 25 facilities nationwide. Interrater reliability was evaluated by comparing the results of multiple pairs of clinicians of differing disciplines, each pair assessing the same patient. The total score was .86 on the FIM admission scores (based on 303 observer pairs), and .88 on the FIM discharge scores (based on 184 observer pairs). Both reflect consistent and good interrater reliability (Granger et al., 1986).

Validity was evaluated by means of specific questions regarding difficulty, unnecessary items, and items that should be added. Eighty-eight percent of the evaluators did not have difficulty. Ninety-seven percent of the evaluators felt there were no unnecessary items, and 83 percent felt no need for more items. The average score on an evaluation item regarding adequacy of the FIM as a measure of severity of disability was 3.5 on a 5-point scale, which is in the better than average range (Granger et al., 1986).

Precision evaluation of the FIM regarding how small a change is detectable from admission to discharge was adequate (10.7, $\underline{SD}^{\pm}$ 1.5 FIM units).

The FIM was administered to all subjects in this study. The data were collected from the patient's charts, patient files on the rehabilitation unit, and a data printout of name, age, insurance coverage, secondary diagnoses, and discharge placement for all patients admitted to Rhode Island Hospital's rehabilitation unit between August 1, 1987 and April 1, 1989.

Collection

Data were collected by the researcher over a period of one month using a data collection form (Appendix E). FIM scores regarding the initial and the final level of independence in grooming, bathing, upper body dressing, lower body dressing, toilet transfers and cognition were gathered from the rehabilitation unit charts. Data regarding insurance coverage, age, number of complicating diagnoses, and discharge destination were gathered from data printout sheets produced specifically for this research project by the Rhode Island Hospital Computerized Data Center. Patient charts from the Rhode Island Hospital medical records department were reviewed for data regarding hours of self-care treatment, side of lesion of cerebrovascular accident, and for clarification of previously gathered data that was either incomplete or missing from the other two data sources. Computation of the changes in FIM scores for grooming,

bathing, upper body dressing, lower body dressing, and toilet transfers, along with the total change score was completed by the researcher on the data collection form. Severity of dysfunction, as previously defined, was also computed by the researcher on the data collection form.

Subject confidentiality was protected by eliminating names, and assigning numbers to the data collection forms, by eliminating sex, and by recording age as a range. No individual patient consent forms were necessary for this study given the above recording methods. The total data set included 83 subjects.

Data Analysis

The variables in this study are either inherently quantitative in nature or could easily be assigned numerical values. Statistical tests were selected in order to determine the degree of relationship between variables. Regression analysis, Analyses of Variance, and the Pearson product-moment correlation were used for a computerized analysis of the data.

CHAPTER 4

DATA AND RESULTS

Introduction

The first section of this chapter discusses the demographics of the sample. The second section relates data relevant to all questions (1 through 6) for this study. The final section relates significant data that is not directly related to the questions asked in this study, but is relevant to one of the goals of this study, which is to provide data and raise further questions about the factors that influence outcomes in self-care function in people disabled by cerebrovascular accident.

Demographics

Sample

One hundred and three patient files from the Rhode Island Hospital rehabilitation unit were reviewed for this study. Fifteen patient records could not be used because the patient stayed less than one week on the unit and were given only one set of FIM scores. Three patient records were not available at the time the data were being gathered. Two patient records could not be used because they indicated

that the occupational therapy received did not include self-care. Eighty-three subjects comprised the sample for this study, which was 81% of the available population.

Diagnosis

Of the 83 subjects included, 38 (46%) experienced a left hemisphere CVA, 42 (50%) experienced a right hemisphere CVA, and 3 (4%) experienced a CVA that could not be classified as either left or right (Table 1).

Age

Subjects were divided by age into five categories of nine years each. These were 46 to 55 years, 56 to 65 years, 66 to 75 years, 76 to 85 years, 86 to 95 years, and under 46 years. One subject (1%) was under 46 years of age. One subject (1%) was between 46 years and 55 years old. Fourteen subjects (17%) were between 56 years and 65 years old. Thirty subjects (36%) were between 66 years and 75 years old. Thirty-four subjects (41%) were between 76 years and 85 years old. Three subjects (4%) were between 86 years and 95 years old (Table 2).

Severity of Dysfunction

FIM admission scores were used to categorize subjects according to severity of disability when admitted. Severe

Table 1

Distribution of the Sample According to Diagnosis

Data	Diagnosis		
	Left CVA	Right CVA	Other
n	38	42	3
%	46%	50%	4%

Note. Left CVA = left hemisphere cerebrovascular accident. Right CVA = right hemisphere cerebrovascular accident. Other = Cerebrovascular accidents that could not be classified as either right or left. n = number of subjects in that category.

Table 2

Distribution of the Sample According to Age Category

Data	Age					
	<46	46-55	56-65	66-75	76-85	86-95
n	1	1	14	30	34	3
%	1%	1%	17%	36%	41%	4%

Note. n = number of subjects in that category.

disability included subjects with no more than 2 of the 5 (grooming, bathing, upper body dressing, lower body dressing, toilet transfers) FIM admission scores above 1.0. Twenty-seven subjects (32%) fell into the severely impaired category. Moderate disability included subjects with no more than 2 of the 5 FIM admission scores below 1.3. Twenty-two subjects (27%) fell into the moderately impaired category. Mild disability included subjects with no more than 2 of the 5 FIM admission scores below 1.7. Thirty-four subjects (41%) fell into the mildly impaired category (Table 3). (The FIM scores are based on .5 = total assistance, 1 = maximal assistance, 1.3 = moderate assistance, 1.7 = minimal assistance, 2 = supervision, 3 = modified independence, and 4 = complete independence.)

Complicating Diagnoses

Another category of data used to measure severity of disability was complicating diagnoses. Data pertaining to complicating diagnoses were gathered from computer printouts from Rhode Island Hospital's Computerized Data Base. The printouts listed complicating diagnoses that occurred between admission and discharge for each subject. Data consisted of the number of complicating diagnoses for each subject.

Twenty-one subjects (25%) had no complicating diagnoses

Table 3

Distribution of the Sample by Level of Severity of Disability When Admitted to the Rehabilitation Unit

Data	Level of Severity		
	Severe	Moderate	Mild
n	27	22	34
%	32%	27%	41%

Note. Severe disability = no more than 2 of the 5 (grooming, bathing, upper body dressing, lower body dressing, toilet transfers) FIM admission scores above 1.0. Moderate disability = no more than 2 of the 5 FIM admission scores are below 1.3. Mild disability = no more than 2 of the 5 FIM admission scores are below 1.7. The FIM scores are based on .5 = total assistance, 1 = maximal assistance, 1.3 = moderate assistance, 1.7 = minimal assistance, 2 = supervision, 3 = modified independence, and 4 = complete independence. n = number of subjects in that category.

other than the primary diagnosis of CVA.

Sixty-two subjects (75%) had complicating diagnoses with a low of 1 additional diagnosis to a high of 5. Table 4 outlines the results for the total sample and for each of the subsamples (severity, moderately, and mildly disabled).

Sex

Data regarding sex were not collected because no studies in the literature identified sex as a factor relevant to change in functional outcome following a cerebrovascular accident.

Questions

Introduction

Three statistical tests were used to analyze the data: the Analysis of Variance (ANOVA), the Pearson product-moment correlation, and regression analysis. A significance level of .05 was set to determine the significance of the findings.

Question 1

Does occupational therapy documentation on the Functional Independence Measure show an increase in independence of overall self-care skills and self-care skills in the areas of grooming, bathing, upper body

Table 4

Distribution of Complicating Diagnoses for the Total Sample and by Level of Disability

Complicating Diagnoses	Total Sample and Subsamples			
	Total	Severe	Moderate	Mild
Mean Number	1.6	1.9	1.5	1.5
%	75%	89%	68%	68%
n	83	27	22	34

Note. Complicating diagnoses are the number of diagnoses sustained by subjects in addition to the diagnosis of cerebrovascular accident. n = number of subjects included in that group or subgroup.

following occupational therapy for these functions in patients disabled by cerebrovascular accident?

The results pertaining to this question will be presented according to overall increase in FIM scores, and according to increases in each of the self-care categories of grooming, bathing, upper body dressing, lower body dressing, and toilet transfers.

Overall Change

Overall change is scored as the difference between the sum of the admission FIM scores, and the discharge FIM scores in the five self-care areas of grooming, bathing, upper body dressing, lower body dressing, and toilet transfers.

Seventy-seven subjects (93%) showed an increase in overall change score after occupational therapy (n = 83). The mean total change in FIM score was 3.7 ($SD \pm 2.9$) points.

Twenty-five subjects (93%) who were admitted with severe impairments (n = 27) showed an increase in overall change score. The mean overall change was 3.3 ($SD \pm 2.3$) points.

Nineteen subjects (86%) who were admitted with moderate impairments (n = 22) showed an increase in overall change scores. The mean overall change showed an increase by 1.5 ($SD \pm .5$) points.

Thirty-three subjects (97%) who were admitted with mild

impairments (n = 34) showed a positive overall change score. The mean overall change showed an increase by 1.6 (SD±.5) points. Table 5 outlines these data.

Grooming

Change in the self-care skill of grooming was calculated by subtracting the FIM admission score for grooming from the FIM discharge score for grooming. This was called the grooming change score.

Fifty-two of the total population (64%) showed an increase in the grooming change score (n = 81). The mean change was .7 points (SD±.8).

Twenty-one subjects (80%) in the severely impaired category showed an increase in the grooming change score (n = 26). The mean change was .8 points (SD±.7).

Nine subjects (41% in the moderately impaired category showed an increase in the grooming change score (n = 22). The mean change was .3 points (SD±.7).

Twenty two subjects (67%) in the mildly impaired category showed an increase in the grooming change score (n = 33). The mean change was .9 points (SD±.8). Table 5 presents these data.

Bathing

Change in the self-care skill of bathing was calculated

Table 5

Change in Funcitonal Independence Measure Scores From Admission to Discharge Relative to Severity of Disability

FIM Mean Change Scores	Severity of Disability			
	Total	Severe	Moderate	Mild
Overall Mean	3.7	3.3	1.5	1.6
SD	2.9	2.3	.5	.5
% Increased	93%	93%	86%	97%
Grooming Mean	.7	.8	.3	.9
SD	.8	.7	.7	.9
% Increased	64%	80%	41%	67%
Bathing Mean	.7	.6	.4	1.0
SD	.7	.7	.7	.9
% Increased	74%	85%	68%	68%
Upper Body Mean	.8	.8	.7	1.0
SD	1.0	.8	1.0	1.0
% Increased	64%	70%	55%	62%
Lower Body Mean	.6	.6	.6	.7
SD	.7	.5	.7	.8
% Increased	73%	81%	77%	65%

(Continued)

Table 5 (Continued)

Transfer Mean	.7	.7	.6	.9
SD	.8	.9	.8	.9
% Increased	56%	73%	57%	76%
Cognition Mean	2.3	1.7	2.2	2.9
SD	.8	.7	.8	.9

Note. The F.I.M. scores are based on .5 = total assist, 1 = maximal assist, 1.3 = moderate assist, 1.7 = minimal assist, 2 = supervision, 3 = modified independence, 4 = complete independence. Severe = Level of disability where no more than 2 of the 5 FIM admission scores are above 1.0, moderate = Level of disability where no more then 2 of the 5 FIM admission scores are below 1.3, mild = Level of disability where no more than 2 of the 5 FIM admission scores are below 1.7. Overall mean = mean of the sum of all 5 FIM self-care skills scores.

by subtracting the FIM admission score in bathing from the FIM discharge score. This was called the bathing change score.

Sixty-one of the total population (75%) showed an increase in the bathing change score (n = 83). The mean change was .7 points (SD±.7).

Twenty-three subjects (85%) in the severely impaired category showed an increase in the bathing change score (n = 27). The mean change was .6 points (SD±.7).

Fifteen subjects (68%) in the moderately impaired category showed an increase in the bathing change score (n = 22). The mean change was .4 points (SD±.7).

Twenty-three subjects (68%) in the mildly impaired category showed an increase in the bathing change score (n = 34). The mean change was 1 point (SD±.9). Table 5 presents these data.

Upper Body Dressing

Change in the self-care skill of upper body dressing was calculated by subtracting the FIM admission score in upper body dressing from the FIM discharge score. This was called the upper body change score.

Fifty-three of the total population (64%) showed an increase in the upper body dressing change score (n = 83). The mean change was .8 points (SD±.9).

Nineteen subjects (70%) in the severely impaired category showed an increase in the upper body dressing score (n = 27). The mean change was .8 points ($SD^{\pm}$.8).

Twelve subjects (55%) in the moderately impaired category showed an increase in the upper body dressing score (n = 22). The mean change was .7 points ($SD^{\pm}$1.0).

Twenty-one subjects (62%) in the mildly impaired category showed an increase in the upper body dressing score (n = 34). The mean change was .1 point ($SD^{\pm}$1.0). Table 5 presents these data.

Lower Body Dressing

Change in the self-care skill of lower body dressing was calculated by subtracting the FIM admission score for lower body dressing from the FIM discharge score. This was called the lower body change score.

Sixty-one of the total population (73%) showed an increase in the lower body dressing score (n = 83). The mean change was .6 points ($SD^{\pm}$.7).

Twenty-two subjects (81%) in the severely impaired category showed an increase in the lower body dressing score (n = 27). The mean change was .6 points ($SD^{\pm}$.5).

Seventeen subjects (77%) in the moderately impaired category showed an increase in the lower body dressing score (n = 22). The mean change was .6 points ($SD^{\pm}$.7).

Twenty-two subjects (65%) in the mildly impaired

category showed an increase in the lower body dressing score (n = 34). The mean change was .7 points ($SD^{\pm}$.8). Table 5 presents these data.

Transfers

Change in the self-care skill of toilet transfers was calculated by subtracting the FIM admission score for toilet transfers from the FIM discharge score. This was called the toilet transfer change score.

Fifty-six of the total population (69%) showed an increase in the toilet transfer change score (n = 81). The mean change was .7 points ($SD^{\pm}$.8).

Nineteen subjects (73%) in the severely impaired category showed an increase in the transfer change score (n = 26). The mean change was .7 points ($SD^{\pm}$.8).

Twelve subjects (57%) in the moderately impaired category showed an increase in the transfer change score (n = 21). The mean change was .6 points ($SD^{\pm}$.8).

Twenty-six subjects (76%) in the mildly impaired category showed an increase in the transfer change score (n = 34). The mean change was .9 points ($SD^{\pm}$.9). Table 5 presents these data.

According to these data, the subjects showed an increase in independence on occupational therapy documentation.

Question 2

Is there a significant relationship between increase in self-care scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfer) and time spent in self-care intervention provided by the occupational therapist for persons who have sustained a cerebrovascular accident?

There was no significant relationship found between time (hours) spent in self-care treatment and increase overall in self-care skills score in the sample as a whole or in the smaller categories of severely, moderately, and mildly impaired subjects. Statistical tests applied were the Pearson product-moment correlation (r = .006, p = .96) and the regression analysis.

The mean number of hours spent in self-care treatment is summarized in Table 6.

Question 3

Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfer) and hemisphere of lesion in those persons who have sustained a cerebrovascular accident?

There was no significant relationship found between change in self-care skills score and hemisphere of lesion.

Table 6

Mean Hours of Self-Care Treatment

	Level of Severity			
Hours	Overall Sample	Severe	Moderate	Mild
Mean	6.9	7.5	8.5	5.4
SD	3.8	3.6	4.4	3.0

Note. Severe disability = no more than 2 of the 5 FIM admission scores (grooming, bathing, upper body dressing, lower body dressing, toilet transfers) are above 1.0. Moderate disability = no more than 2 of the 5 FIM admission scores are below 1.3. Mild disability = no more than 2 of the 5 FIM admission scores are below 1.7. The FIM scores are based on .5 = total assistance, 1 = maximal assistance, 1.3 = moderate assistance, 1.7 = minimal assistance, 2 = supervision, 3 = modified independence, and 4 = complete independence.

The statistical test applied was the ANOVA (r^2 = .08, p = .07).

Question 4

Is there a significant relationship between change in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfer) and age in those persons who have sustained a cerebrovascular accident?

There was a significant negative relationship found between overall self-care skills score and age in the sample as a whole. The statistical test applied was the Pearson product-moment correlation (r = .24, p = .03). No significant correlations were found between age and the smaller categories of severely, moderately, or mildly impaired subjects. No significant relationship was found between age and the individual self-care skill areas of grooming, bathing, upper body dressing, lower body dressing, and toilet transfer.

Question 5

Is there a significant relationship between amount of increase in the self-care skills scores (overall, grooming, bathing, upper body dressing, lower body dressing, toilet transfer) and severity of dysfunction at the time the

patient was admitted to the rehabilitation unit?

There was no significant relationship found between change in the overall self-care skills score and severity of dysfunction at admission in the sample as a whole or in the smaller categories of severely, moderately, or mildly impaired subjects. The statistical test applied was the Pearson product-moment correlation ($r = -.15$, $p > .05$).

Question 6

What is the relationship between discharge level of self-care and discharge placement?

The researcher learned during the study that the data regarding discharge placement were invalid. An unofficial criterion for acceptance to the rehabilitation unit at Rhode Island Hospital is that the patients' families are willing to take them home after their stay, regardless of their final level of independence in self-care. Therefore the data were disregarded.

Other Findings

There were findings not addressed in the questions that have implications for occupational therapy treatment practices with patients who have sustained a CVA and are admitted to the rehabilitation unit at Rhode Island Hospital.

The most significant of these findings was the relationship between the amount of change in overall self-care skills score and cognitive level at the time the patients were admitted to the unit (measured on the FIM rating scale by the neuropsychology technician or intern on the rehabilitation unit). This relationship was significant when a Pearson product-moment correlation was applied (r = .33, p = .005) and was selected as the best (and only) predictor of total change on the FIM scale by a regression analyses of variance. Table 5 presents these data in relation to self-care change scores.

Another significant finding was that, when FIM scores were used to categorize subjects according to severity of disability, forty-one percent of the subjects in all categories moved into a less impaired category, 4% of the subjects in all categories moved into a more impaired category, and 55% of the subjects in all categories did not change categories. Table 7 presents these data.

Other findings were that age, severity of disability, and cognition were predictor variables for hours of treatment in self-care received on the rehabilitation unit, and that severity of disability also predicted length of stay. Table 8 presents these data.

Table 7

Change in Overall Self-Care Independence Measured by Movement into Another Category of Disability

Change In Category	Total Sample and Subsamples			
	Total	Severe	Moderate	Mild
Increase	41%	70%	73%	[a]
Decrease	4%	[b]	4%	3%
No Change	55%	30%	23%	97%
n	83	27	22	34

Note. Severe disability = no more than 2 of the 5 FIM admission scores (grooming, bathing, upper body dressing, lower body dressing, toilet transfers) are above 1.0. Moderate disability = no more than 2 of the 5 FIM admission scores are below 1.3. Mild disability = no more than 2 of the 5 FIM admission scores are below 1.7. The FIM scores are based on .5 = total assistance, 1 - maximal assistance, 1.3 = moderate assistance, 1.7 = minimal assistance, 2 = supervision, 3 = modified independence, and 4 = complete independence.

[a]The ceiling effect prevents subjects in this category from moving up.

[b]The ceiling effect prevents subjects in this category from moving down.

Table 8

Variables Predictive of Hours and Length of Stay In Rehabilitation

		Predictors		
Variables		Age	Severity	Cognition
Hours	r	-.31	.25	-.33
	p	.01	.03	.005
LOS	r	-	.27	-
	p	-	.02	-

Note. Hours = hours of self-care treatment. LOS = length of stay. Severity = severity of disability when admitted as measured by the FIM. Cognition = cognitive level when admitted as measured by the FIM.

CHAPTER 5

DISCUSSION, IMPLICATIONS, RECOMMENDATIONS, AND SUMMARY

Introduction

The first section of this chapter discusses the results for each of the research questions. The second section addresses implications for the Rhode Island Hospital rehabilitation unit, and research recommendations. The final section summarizes the study.

Research Questions

Improvement in Self-Care Skills Scores

The results of this study answered the question regarding change in self-care skills scores (overall score, grooming score, bathing score, upper body dressing score, lower body dressing score, and toilet transfer score) after occupational therapy. A significant percentage of patients showed positive change in all areas of self-care between admission and discharge. Findings regarding percent and amount of improvement are outlined in Table 5, page 50.

These results are consistent with findings in studies by Dombovoy, Sandok, and Basford (1986); Granger, Hamilton,

and Sherwin (1986); Lehman et. al. (1975); Parfenchuck, Paiziale, Lieberman, and Butcher (1989); Shilliman, Wagner, and Fletcher (1987); and Smith, Garraway, Smith, and Akhtar (1982), all of which found improvement in self-care function after rehabilitation that included occupational therapy. It is not possible, however, to directly compare the results of this study with the studies cited above because many of them included studies of populations with varied diagnoses, many included both in patients and out patients, and all of them used different instruments to evaluate functional independence.

Unfortunately, the amount of improvement attributable to spontaneous recovery was not discernible in this study. It was not possible to include a control group due to the ex post facto design. Even in a study of experimental design, however, a control group would involve withholding treatment, believed to be beneficial.

These findings indicate that a very high percentage of all CVA patients admitted to Rhode Island Hospital's rehabilitation unit will improve in the areas of grooming, bathing, upper body dressing, lower body dressing, and toilet transfers following occupational therapy for these functions.

Relationship Between Improvement and Hours of Treatment

No significant correlation was found between increase in

overall self-care scores and hours of treatment, or between any of the scores in specific self-care skills (grooming, bathing, upper body dressing, lower body dressing, and toilet transfers) and hours of treatment. In fact, the correlation was very close to zero ($p = .96$).

This finding seems to imply that the amount of time spent in occupational therapy treatment for self-care may have no influence on the degree of independence the subjects in this study achieved in self-care. However, there are some conditions for treatment that are unique to the DRG exempt rehabilitation unit that may have affected the data.

One condition of note is that patients are not discharged from the rehabilitation unit for failure to improve in self-care score, as they would be on the acute care floors. Their length of stay is decided on a weekly basis, and is dependent on overall progress in many areas (neuropsychology, physical therapy, and speech therapy).

Another condition of note is that discharge is also based on the family's readiness to take the patient home. This involves arranging occupational and physical therapy teaching sessions with the families which can delay discharge because of scheduling conflicts.

Therefore, many of the subjects continued to receive self-care treatment (which included family teaching in self-care) after they stopped improving on the FIM scale because

a) their families needed several teaching sessions and b) Medicare regulations required 90 minutes of occupational therapy daily while patients were on the rehabilitation unit.

Occupational therapy interventions in addition to self-care are usually appropriate for CVA patients. However, the other interventions frequently require attention spans and comprehension skills that are greater than those possessed by patients who have moderate and severe residual cognitive and functional impairments due to CVA (this is a relationship supported by a high correlation ($p \leq .001$) found between FIM cognition score and level of severity on admission in this study). Many patients with moderate to severe impairments are only able to attend for, and therefore benefit from, 30 minutes of occupational therapy intervention requiring attention skills. Self-care and transfers are, therefore, frequently the best treatment choice for the additional 60 minute requirement because their attention and comprehension needs are lower. Since discharge due to lack of progress in occupational therapy is not an option on the rehabilitation unit, numerous hours of self-care treatment may be accumulated in an effort to achieve improvement, but with very little measurable improvement being made. Additionally, time spent teaching families self-care and transfer techniques is counted in hours of self-care treatment but does not produce improved

self-care scores. These are possible explanations for the lack of correlation between these variables.

It is also possible, as Lind (1982) concluded, that rehabilitation has a negligible effect on function. Or, it is possible that, as Smith, Garraway, Smith, and Akhtar (1982) observed, early initiation of rehabilitation may be more important than the amount or duration of treatment.

These findings lend support to studies like Johnston and Miller's (1986) on the lack of cost-effectiveness of the Medicare three-hour regulation. They simultaneously raise the question of a need for grading the intensity of rehabilitation to the varying needs of patients. They suggest that increased hours of self-care treatment does not yield increased function in self-care in the CVA population on Rhode Island Hospital's rehabilitation unit.

Relationship Between Hemisphere of Lesion and Improvement

Hemisphere of lesion is frequently reported in CVA research. This is because each cerebral hemisphere is believed to possess specific functions that may influence a patient's ability to recover particular skills. One common theory is that patients who have sustained lesions in the right hemisphere of the brain will have more difficulty with self-care because the right hemisphere processes spatial and visual- perceptual information that is necessary in the self-

care process.

This study found no correlation between hemisphere of lesion and increase in self-care skills scores. This finding supports findings by Mills and DiGenio (1984), and Wade, Hewer, and Wood (1984), and also supports the practice that side of lesion should not be used to differentiate or predict a patient's ability to benefit from self-care treatment in the CVA population.

Relationship Between Age and Improvement

Age is a variable which is commonly examined in rehabilitation literature in an effort to predict which patients will benefit most from rehabilitation services.

In this study, age correlated negatively ($p \leq .05$) with overall self-care score. This means that as age increased, the overall self-care score (level of independence) decreased, and vice-versa.

This finding is consistent with those of Silliman, Wagner, and Fletcher (1987) who studied 147 stroke patients and also found that age correlated negatively with functional outcome.

This finding is not consistent with the findings of Lind (1982), who combined data from 7 studies of rehabilitation effectiveness with populations of subjects sustaining CVA, and Carey, Seibert, and Posavac (1988), who studied, among

other things, the effect of age in a sample of subjects with multiple diagnoses. Both found that age did not affect functional outcome.

Age also correlated negatively with hours of treatment (p = .01) in this study. This indicates that older patients received fewer hours of self-care treatment. Age did not correlate, however, with length of stay, severity of disability, or level of cognition. Without correlations in the other areas, it is difficult to explain this finding.

In consideration of the above, it seems prudent to conclude that age can be used cautiously to predict potential benefits from self-care treatment in the CVA population.

Relationship Between Level of Severity at Admission and Change in Self-Care Scores

Many studies have reported that level of severity of disability when admitted to rehabilitation has a significant impact on amount of improvement.

Carey, Seibert, and Posavac (1988) found that in a population of 6,000 patients with multiple diagnoses, those who were admitted with less than 50% of self-care independence showed greater improvement than those who entered with more than 50% of self-care independence. They noted, however, that the scores of those with greater

admission levels suffered from the "ceiling effect" present in all measures of self-care function.

Dove, Schneider, and Wallace (1984), in a population of 97 subjects who sustained CVAs, found that increased severity of disability when admitted correlated significantly with decreased function at discharge.

Granger, Sherwood, and Greer (1977), in a study of 269 CVA patients, found that patients with severe functional disabilities when admitted were less likely to improve significantly than those with moderate and mild disabilities.

Seitz, Allred, Backus, and Hoffman (1987), however, found that in a population of 212 stroke patients admitted to an acute rehabilitation unit, subjects who were most severely disabled on admission showed the most gains per length of stay and that the least involved patients showed the most total gains.

This study found that patients admitted with severe and mild disabilities made the greatest increase in overall self-care score and in the three subcategories of grooming, upper body dressing, and toilet transfers. Exceptions were in the bathing category, in which the percentage of subjects changing was the same for the moderately and mildly disabled groups (but the amount of change was greater for the mildly disabled group), and in the lower body dressing category, in

which the severely disabled group had the most subjects changing followed by the moderately disabled group and finally the mildly disabled group. Table 5 outlines the results (page 50).

The relationship between severity at admission and change in self-care skills scores was not significant for overall self-care skills score or for change in each of the subcategories (grooming, bathing, upper body dressing, lower body dressing, and toilet transfers) when correlated to the sample as a whole or to the subcategories of mildly, moderately, and severely disabled subjects.

These results indicate that severity of disability on the FIM scale is not a predictor of overall increase of function in this population.

Relationship Between Level of Disability at Discharge and Discharge Placement

Although the literature supports a strong relationship between discharge level of function and placement after rehabilitation, the statistics from this study could not be used to evaluate this relationship due to invalid data. It was learned during the study that one of the unofficial criteria for admittance to the Rhode Island Hospital Rehabilitation Unit is that the family has agreed to take the patient home regardless of the level of disability at that time.

Other Findings

Cognitive level has frequently been associated in the literature with the amount of functional improvement shown by patients with CVA. Dombovoy, Sandok, and Basford (1986); Granger, Sherwood, and Greer (1977); Lind (1982); Seitz, Allred, Backus, and Hoffman (1987); and Wade, Wood, and Hewer (1985) all found cognitive level to be an important predictor of functional ability after rehabilitation in the CVA population. Although it was not stated as a question for this study, the data on cognition levels at admission correlated highly with overall self-care skills score ($p = .005$), bathing score ($p = .01$), toilet transfer score ($p = .001$), hours of treatment ($p = .005$), and severity of disability at admission ($p < .001$). Additionally, a regression analysis of variance found that of all the variables considered in this study, cognitive level was the best and only predictor of outcome. Being able to predict outcome from cognition is important to the profession of occupational therapy in its effort to provide efficient and cost-effective services and to the rehabilitation service consumer who wants to avoid repetitive, non-productive treatment. (Table 5 outlines cognitive level means according to level of disability.)

This finding indicates that FIM cognitive scores are

good predictors of functional outcome in the CVA population.

Implications for Rhode Island Hospital

The most significant finding in this study was the strong correlation between cognitive level and increase in scores of self-care performance. This finding implies that the Rhode Island Hospital (RIH) rehabilitation unit should concentrate more, but not exclusively, on cognitive ability as a predictor of benefit from their rehabilitative services.

The next most significant finding is that, while the RIH rehabilitation unit should note that almost all CVA patients improve in self-care from their level of function when admitted, many reach a plateau yet continue to receive self-care treatment. Although some of the treatment is focused on family teaching as opposed to increasing self-care functioning, the findings show that there are many hours of self-care treatment that do not produce improvement in function. The alternatives are to 1) provide patients who are not demonstrating improvement in self-care with other types of occupational therapy intervention, 2) to increase therapy in other disciplines where they are showing improvement in order to meet the Medicare three-hour regulation, and 3) to advocate for a change in the Medicare regulations that would allow for grading the intensity of rehabilitation to the needs of the patient.

The final implication derived from the findings is that while age can be cautiously used in conjunction with cognition to predict the ability to benefit from self-care treatment, severity of disability, complicating diagnoses, and side of lesion are not good predictors of self-care improvement in the CVA population on the Rhode Island Hospital rehabilitation unit.

Research Recommendations

Further research with the CVA population in this area should include 1) a study that controls for spontaneous recovery in self-care function, possibly by matching subjects in hospitals that do not provide occupational therapy with hospitals that provide occupational therapy, 2) a controlled study that compares the effectiveness of different hourly amounts of self-care treatment with differing levels of disability in order to assess the cost-effectiveness of Medicare's three-hour regulation, and 3) a controlled study that includes assessment of the effects of family support and socioeconomic level on improvement in function but is not influenced by discharge constraints and Medicare's three-hour regulation.

Summary

The purpose of this study was to examine the variables that affect increases in self-care functioning, including

occupational therapy, in a population of patients who had sustained CVAs, with the intention of determining predictors of progress in self-care functioning and of determining the cost effectiveness of occupational therapy for treatment of self-care.

A review of the literature revealed few studies on the response to self-care activities following CVA. The available data suggest that cognition, family support, and socioeconomic status play an important role in functional status improvement. There is controversy over the effects of age, side of lesion, severity of disability, early onset of rehabilitation after admission, and hours of rehabilitation.

In this study, the effects of severity of disability, complicating diagnoses, side of lesion, age, and hours of self-care treatment on increases in self-care functioning were examined.

The results of the study supported cognition and, to a lesser degree, age as predictors of improvement in self-care scores. It also found that severity of disability, side of lesion, complicating diagnoses and, surprisingly, hours of treatment in self-care did not have a significant effect on improvement in self-care scores. The results did indicate, however, that most people improve functionally from deficits caused by CVA during acute rehabilitation.

These results led to recommendations that rehabilitation units consider relying more heavily on cognition as a predictor of functional outcome and that more consideration of discharge from self-care treatment be made once a plateau has been reached in that area. Further study into the degree to which spontaneous recovery and amount of self-care treatment influence recovery after CVA is recommended.

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APPENDICES

APPENDIX A

FUNCTIONAL INDEPENDENCE MEASURE PROTOCOL

GUIDE

FOR USE OF THE

UNIFORM DATA SET

FOR MEDICAL REHABILITATION

PREPARED BY THE TASK FORCE FOR DEVELOPMENT

OF A UNIFORM DATA SYSTEM FOR MEDICAL REHABILITATION

PROJECT OFFICE

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8/29/86

CONTENTS

UNIFORM DATA SET FOR MEDICAL REHABILITATION

BACKGROUND

The Task Force to Develop a Uniform Data System for Medical Rehabilitation was established in 1983 to meet a long-standing need to document severity of patient disability and the outcomes of medical rehabilitation. Presently there is no uniform way to describe and communicate about disability. The Task Force is sponsored by the American Congress of Rehabilitation Medicine (ACRM) and American Academy of Physical Medicine and Rehabilitation (AAPM&R).

A grant* was obtained from the National Institute of Handicapped Research to develop a minimum data set that would be an appropriate, quickly and uniformly administered, valid and reliable measure, and in addition would be discipline-free and acceptable to the clinicians in the field. Data collected on key patient functional attributes in a consistent fashion will allow clinicians and researchers to track patients from the initiation of hospital care through discharge and follow-up. With periodic reassessment, changes in patient performance over time can be measured and rehabilitation outcomes determined. There are many uses for this kind of information.

The Task Force reviewed 36 published and unpublished functional assessment instruments which would be helpful in identifying items and rating scales that measure function. The challenge for the Task Force was to select the most common and useful functional assessment items and to decide on an appropriate rating scale which would permit most rehabilitation clinicians to assess severity of disability in a uniform and reliable manner.

The Functional Independence Measure (FIM) was derived for this purpose. It assesses self care, sphincter management, mobility, locomotion, communication, and social cognition on a four-level scale, expandable to seven levels.

The data set includes, in addition, items which document patient demographic characteristics, diagnoses, impairment groups, length of hospital inpatient stay, and charges.

A trial study was carried out between July 1985 and April 1986 for the purpose of testing the FIM for validity and reliability in 28 facilities across the country. The FIM was found to have face validity and to be reliable. The trial findings resulted in some modifications of this GUIDE, the data set, and definitions. This version of the GUIDE reflects those changes and is provided for your use in carrying out the Implementation Phase at your facility.

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* The Uniform Data System for Medical Rehabilitation is being developed with support from the U.S. Department of Education, National Institute of Handicapped Research (NIHR), grant number G008435062, and is being conducted by the State University of New York at Buffalo, School of Medicine, Department of Rehabilitation Medicine.

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[1]Initiated by the American Congress of Rehabilitation Medicine and the American Academy of Physical Medicine and Rehabilitation, November 1983.

[2]At the September 1985 meeting, the Task Force was expanded to form an Advisory Committee that would include in addition to the members of the Task Force representatives of the endorsing organizations and the allied health organizations.

[3]Representatives of the American Hospital Association (AHA), the National Association of Rehabilitation Facilities (NARF), and the National Easter Seal Society began to work with the Task Force in 1984. Other sponsoring organizations were represented by liaison persons already members of the Task Force. The project was also endorsed by the Commission on Accreditation of Rehabilitation Facilities and the National Association of Rehabilitation Research and Training Centers.

[4]Involvement of the allied health organizations began in late 1984.

UNDERLYING PRINCIPLES FOR USE OF THE FUNCTIONAL INDEPENDENCE MEASURE (FIM)

The Functional Independence Measure is intended to include a minimum number of items. It is not expected to incorporate all the activities that would be possible to measure or that might need to be measured for clinical purposes. Rather, it is a basic indicator of severity of disability.

The FIM has been designed to be used with a four-level scale which represents major differences in independent and dependent behavior and reflects the burden of care for disability. The underlying rationale for classifying an activity as independent or dependent is whether another person, a helper, is required. As you begin to use the FIM, you will note that the intervals between the four levels are not exactly equal. Thus, a variety of human assistance subcategories are included under Levels 2 and 1. Designating these subcategories is optional and whether the subcategories are used will depend on the anticipated purposes of collecting the data. If the data obtained from the FIM are used for program evaluation, a four-level scale will be appropriate. If, on the other hand, the FIM is used for treatment planning or monitoring, the seven-level scale (using the subcategories) may be the better choice. The FIM has been designed to provide sufficient flexibility so that it can be used for both purposes. The majority of items -- feeding, grooming, bathing, dressing, toileting, mobility, transfer, locomotion, and stairs -- can be assessed effectively on a seven-level scale. There are some items, however, which cannot be assessed on a seven-level scale. These are bowel, bladder, comprehension, expression, social interaction, problem solving, and memory.

The FIM is a measure of disability, not impairment. The FIM is intended to measure what the subject* actually does, whatever his or her diagnosis or impairment, not what he or she ought to be able to do, or might be able to do if certain circumstances were different. As an experienced clinician, you may be well aware that a depressed person could do many things he or she is not doing, but nevertheless the person should be assessed on the basis of what he or she actually does. Note also that there is no provision to consider an item "not applicable."

The FIM was designed to be discipline-free, that is, a measure usable by any trained clinician, regardless of discipline. However, under some circumstances, certain clinicians may find it difficult to assess some activities. If that is the case, another more appropriate clinician can participate in the FIM assessment of any one patient. If it is felt that only a speech pathologist can assess the communication items whereas a nurse is more knowledgeable with respect to bowel and bladder management and a physical therapist has the expertise to evaluate mobility, the assessment can be divided among them.

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* Subject means the person with disability.

UNDERLYING PRINCIPLES FOR USE OF THE FIM (CONTINUED)

It is important to read the definitions of the items carefully before beginning to use the FIM, committing to memory what each activity includes. Rate the subject only with respect to the specific item. For example, when rating the subject with regard to bowel and bladder management, do not take into consideration whether he or she can get to the toilet. That information will be obtained when transfer is assessed. Similarly, preparation for grooming does not include getting to the washbasin.

To be classified at any given level, the subject must complete either all of the tasks included in the definition or only one of several tasks. If all must be completed, the series of tasks will be connected in the text of the definition by the word and. If only one must be completed, the series of tasks will be connected by the word or. For example grooming includes oral care, hair grooming, washing hands and face, and either shaving or applying make-up, whereas communication includes clear comprehension of either auditory or visual communication.

Implicit in all of the definitions, and stated in many of them, is a concern that the individual perform these activities with reasonable safety. The question to be asked is whether the subject is at risk of injury when performing the task. As is true of all human endeavors, your judgment should take into account that there must be a balance between the risk of an individual's participating in some activities and a corresponding, although different risk, if he or she does not.

Because the data set is still being refined, your opinions and suggestions are considered very important. We are also interested in any problems you encounter in collecting and recording data. Therefore, we have provided a separate form on which are guiding questions and space for your comments. This form, colored blue and labeled "Evaluation Questionnaire" and attached as one of the items in the appendix, enables us to evaluate the current validity of the FIM.

The FIM may be added to a facility's own data set, which may include items such as independent living skills, ability to take medications, to use community transportation, to direct care provided by an aide, or to write or use the telephone, outdoor mobility, impairments such as blindness and deafness, and premorbid status. Many clinicians who participated in the Trial wanted to add such items. But the data set must be limited to the fundamentals of assessing disability and the rehabilitation process. We encourage individual clinicians or centers to adopt additional items for their own use, if this is appropriate.

CODING THE DATA SET

Coded specimen copies of the coding sheet are provided in Appendix A. The specimen code sheets have been completed for some hypothetical cases to help you complete your forms. PLEASE BE SURE TO RECORD DATA ON THE CODING SHEET, AND BE SURE TO COMPLETE ALL THE INFORMATION. DON'T LEAVE ANY BLANKS UNFILLED.

The completed coding sheets can form the data base for your own analysis and reporting. Or you can forward coding sheets from your patients to the project office at the address below. Before

CODING THE DATA SET (CONTINUED)

sending coding sheets to the project office write a letter indicating a desire to enroll in the system. A return letter will give you specific directions on how to enroll, submit data, and receive reports.

Uniform Rehabilitation Data Project
Department of Rehabilitation Medicine
Buffalo General Hospital
100 High Street
Buffalo, New York 14203
Telephone: (716) 845-1645

A. WHEN TO CODE ITEMS IN THE DATA SET

Information will be coded in the data set at at least two times: within 72 hours of patient admission to and upon discharge from inpatient rehabilitation. Follow-up information will be collected at one point at an outpatient visit, home visit, by telephone, or by mailed questionnaire three to six months after discharge, for those facilities which are able to collect it.

B. HOW TO CODE ITEMS IN THE DATA SET

Using the sample coding sheets (Appendix A) as a guide and the item-by-item coding instructions which follow, enter a number or numbers in every appropriate open (blank) box on the coding sheet. Notice that the coding sheet has two sides.

If you have difficulty with the data set see your facility Uniform Data System coordinator or call Fran Sherwin at (716) 845-1645.

CODING INSTRUCTIONS

1. Rehabilitation Facility Code - use facility identification number provided by project staff.

2. Patient Number - subject identification number (maximum nine digits). Use the medical record number, social security number, or unique number that remains consistent throughout the patient's hospitalizations.

3. Admission Date - the initial admission date to rehabilitation.

4. Discharge Date - the date of discharge from rehabilitation. If the subject is transferred off the rehabilitation service and later returns, the discharge date should be the last day spent on the rehab service. An interruption of 30 days or less will be considered the same rehabilitation hospitalization. An interruption of more than 30 days is a new hospitalization, and a new form should be completed.

CODING THE DATA SET (CONTINUED)

5. Program Interrupted - whether the subject was transferred to another medical service during the rehabilitation program. Answer "Yes" or "No." This item is appropriate for those rehabilitation units which are part of larger acute care medical facilities and for freestanding rehabilitation facilities that transfer patients to acute care hospitals. An interruption of any period of 30 days or less will be considered the same rehabilitation hospitalization.

   If yes:
   1st Interruption
   a. Transfer date
   b. Return date

   2nd Interruption
   a. Transfer date
   b. Return date

   3rd Interruption
   a. Transfer date
   b. Return date

6. Admission Class - the admission classification of the subject should be coded as follows:

   1 Initial Rehabilitation - first time admission to a comprehensive rehabilitation program.

   2 Short-Term Evaluation - a preplanned stay for evaluation of fewer than 10 days on the rehabilitation service.

   3 Readmission - any rehabilitation readmission to any rehabilitation facility.

7. Zip Code - write in nine-digit zip code, if available; otherwise five-digit code of the last home before admission.

8. Birthdate - the subject's birthdate: month/day/year.

9. Sex - code the sex of the subject as follows:

   1 Male
   2 Female

10. Race - code the race of the subject as follows:

   1 White
   2 Black
   3 Asian
   4 American Indian
   5 Other

CODING THE DATA SET (CONTINUED)

11. English Language - does the subject understand and speak English? Do not account for aphasia here.

    1 Yes
    2 No
    3 Partial

12. Marital Status - code the subject's marital status at time of admission as follows:

    1 Single (never married)
    2 Married
    3 Widowed
    4 Separated
    5 Divorced

13. Living Arrangement

    a. Setting from which the subject was admitted or to which discharged. Code at admission, discharge, and follow-up. Code as follows:

       01 Home
       02 Board and care facility (includes a structured retirement facility)
       03 Transitional living facility
       04 Intermediate care facility
       05 Skilled nursing facility (nursing home)
       06 Acute unit of your own facility
       07 Another acute hospital
       08 Chronic hospital
       09 Another rehab facility
       10 Other
       11 Expired (deceased) - code only at discharge or follow-up

    b. Living with - the relationship of the individuals (if any) residing with the subject. If living with more than one other person, select in the order of family/relatives, friends. If 13.a. is 02-10, code 13.b. as 5., Other. Code at admission, discharge, and follow-up.

       1 Alone
       2 With Family/Relatives
       3 With Friends
       4 Attendant
       5 Other

CODING THE DATA SET (CONTINUED)

14. Vocational Status

a. Whether the subject was employed or was a student, homemaker, or was retired prior to and following hospitalization for the disabling condition. If more than one, select in the order presented. Code at admission and follow-up

1 Employed (competitive setting)
2 Sheltered employment
3 Student
4 Homemaker
5 Unemployed
6 Retired for age (60 yrs of age or greater)
7 Retired for disability (permanent disability, less than 60 yrs of age)

b. Amount of effort - If subject is retired, code full-time or, if applicable, part-time retirement. If unemployed, code full-time. Code at admission and follow-up.

1 Full time
2 Part time
3 Adjusted workload - workload is reduced due to disability.

CODING THE DATA SET (CONTINUED)

15. Follow-up - the date, source, and method of obtaining follow-up information, who performs health maintenance activities, and current therapy received. Code as follows:

a. Date of follow-up

b. Source of follow-up information

1. Patient
2. Family
3. Other

c. Method of obtaining follow-up information

1. In person
2. By telephone
3. Mailed questionnaire

d. Health maintenance - the person primarily responsible for performing routine personal care, and managing the personal environment at home or in the institution. If only one type of helper is required, code primary and secondary boxes the same. If more than one type of helper is involved, indicate which is primary and which is secondary. Code as follows:

1. Subject him- or herself

2 An unpaid person or family member

3. A paid attendant or aide

4. A paid, skilled professional such as a registered nurse

e. Therapy - the subject is currently receiving therapy which is paid for. Code as follows:

1. None

2. Outpatient therapy

3. Home-based paid therapy such as P.T., O.T., Speech, Nursing (not routine personal care or maintenance)

4. Both

CODING ITEMS IN THE DATA SET (CONTINUED)

16. Impairment Groupings - the major impairment diagnostic category of the subject. Refer to listing below of specific impairment group codes to be included in each category. Choose the appropriate two-digit code shown below first, then decimal designation for subgroup. Note: Refer to the ICD-9 codes shown in Appendix B to help you determine the correct impairment group code. Code as follows:

01.000 STROKE
- 01.100 LEFT BODY INVOLVEMENT
- 01.200 RIGHT BODY INVOLVEMENT
- 01.300 BILATERAL INVOLVEMENT
- 01.400 NO PARESIS

02.000 BRAIN DYSFUNCTION
- 02.100 NON-TRAUMATIC
- 02.200 TRAUMATIC
  - 02.210 OPEN
  - 02.220 CLOSED

03.000 NEUROLOGICAL CONDITIONS - OTHER

04.000 SPINAL CORD DYSFUNCTION
- 04.100 NON-TRAUMATIC
- 04.200 TRAUMATIC
  - 04.__1 PARAPLEGIA
  - 04.__2 QUADRIPLEGIA
    - 04.__ __1 INCOMPLETE
    - 04.__ __2 COMPLETE

05.000 AMPUTATION OF LIMB
- 05.100 Amputation-Single-Upper AE
- 05.200 " - " -Upper BE
- 05.300 " - " -Lower AK
- 05.400 " - " -Lower BK
- 05.500 " -Double-AK/AK
- 05.600 " - " -AK/BK
- 05.700 " - " -BK/BK
- 05.800 " -Other combinations

06.000 ARTHRITIS
- 06.100 RHEUMATOID
- 06.200 OSTEOARTHRITIS
- 06.300 OTHER

07.000 PAIN SYNDROMES
- 07.100 NECK PAIN
- 07.200 BACK PAIN
- 07.300 EXTREMITY PAIN
- 07.400 ABDOMINAL PAIN
- 07.500 PELVIC PAIN
- 07.600 FACIAL PAIN
- 07.700 HEADACHE
- 07.800 OTHER PAIN

08.000 ORTHOPAEDIC CONDITIONS

09.000 CARDIAC

10.000 PULMONARY

11.000 BURNS

12.000 CONGENITAL DEFORMITIES

13.000 OTHER DISABLING IMPAIRMENTS

CODING THE DATA SET (CONTINUED)

17. Date of Onset - the date of onset of the impairment that was coded in Item 16 for which the subject is to be rehabilitated. Maximum of six digits. For conditions which have an insidious onset or if for any other reason the exact date of onset is not known, code as follows:

    a. if the year and month are known, but the exact day is not, use the first day of the month.
    b. if the year is known, but the exact month is not, use the first of January of that year.
    c. if the year is an approximation, use the first of January of the approximate year.

18. Principal Diagnosis - the ICD 9 Code for principal diagnosis or presenting problem for which the subject was admitted to rehabilitation that relates to items 16 and 19. Code at discharge.

19. Other Diagnoses - the relevant additional diagnoses. List ICD 9 Codes (maximum of 7) to include secondary diagnoses and other major conditions. These include medical conditions or complications during initial rehabilitation or occurring after discharge from rehabilitation. Recommend that medical record librarian provide this information. Code at discharge and follow-up.

20. Payment Source - the source of payment of the subject's medical expenses. Code the appropriate category for primary and secondary payment source. If there is no secondary source, enter code 15. Code at discharge.

    a. Primary

    01 Blue Cross
    02 Medicare
    03 Medicaid/Welfare
    04 Commercial Insurance
    05 HMO
    06 Workers' Compensation
    07 Crippled children's services
    08 Regional Centers for Developmentally Disabled
    09 State Vocational Rehabilitation
    10 Private pay
    11 Employee - courtesy
    12 Free
    13 Champus
    14 Other

    b. Secondary — Code as above, or

    15 None

CODING THE DATA SET (CONTINUED)

21. Total Charges

a. Total rehabilitation hospital charges accrued while the subject is on the rehabilitation service. Charges should be consistent with days on the rehabilitation service as coded for Items 3 & 4. If interruption of the rehabilitation inpatient program is 30 days or less, rehabilitation days and total charges should reflect the total stay on the rehabilitation service. Acute hospital days and charges during the program interruption should not be included. If the interruption is greater than 30 days, this constitutes a new (separate) admission and should be reported on a new (separate) coding sheet. Code the actual dollars charged.

b. Do these charges include physician fees? Code as follows:

1 Yes
2 No

22. Functional Independence Measure (FIM)

PROCEDURES FOR COMPLETING AND SCORING THE
FUNCTIONAL INDEPENDENCE MEASURE (FIM)

Record the number which best describes the subject's level of function for every FIM item on the coding sheet.

It is possible to assess subjects based upon either a four-level or seven-level scale. For the four-level scale the scores are: 4.0 - Complete Independence; 3.0 - Modified Independence; 2.0 - Modified Dependence; and 1.0 - Complete Dependence. To assess subjects on a seven-level scale, Modified Dependence is subdivided and scored as follows: 2.0 for supervision; 1.7 for minimal assistance; and 1.3 for moderate assistance. Complete Dependence is subdivided and scored as 1.0 for maximal assistance and 0.5 for total assistance.

Using either the four-level or seven-level scale is optional and depends on the purposes for collecting the data. If the data are used for program evaluation, a four-level scale is adequate. If, on the other hand, the FIM is used for treatment planning or monitoring, the seven-level scale may be preferred. Note that the subcategories (seven-level scale) may not be used to assess Sphincter Control, Communication, or Social Cognition items. The smaller box size on the coding sheet indicates four-level only items. See Appendix E for FIM Four-Level and Seven-Level Scoring Example: Paraplegia.

Each of the 18 items comprising the FIM has a maximum score of 4.0. The lowest score on each item on a four-level scale is 1.0, but on a seven-level scale it is only 0.5. The highest total score on either scale is 72. However, there will be a difference in the lowest total score depending on whether the four-level or seven-level scale is used. The lowest possible total score on a four-level scale is 18, whereas the lowest possible total score on a seven-level scale is 12.5. Therefore, it is imperative that you indicate on the code sheet in the box under "Total" at the bottom of the FIM whether you are using a four- or seven-level scale to assess a patient.

The clinicians in the field have been adamant in their conviction that a seven-level scale is crucial to showing change with sufficient sensitivity. The seven-level option makes the FIM more attractive to users and therefore more likely to be used. However, during the trial phase, the FIM was tested for interrater reliability only on a four-level scale. Therefore, the beginning of the current implementation phase will require an analysis of interrater reliability using the seven-level scale.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

DESCRIPTION OF THE LEVELS OF FUNCTION AND THEIR SCORES

INDEPENDENT--Another person is not required for the activity (NO HELPER).

4.0 COMPLETE INDEPENDENCE--All of the tasks described as making up the activity are typically performed safely without modification, assistive devices, or aids, and within reasonable time.

3.0 MODIFIED INDEPENDENCE--Activity requires any one or more than one of the following: An assistive device, more than reasonable time, or there are safety (risk) considerations.

DEPENDENT--Another person is required for either supervision or physical assistance in order for the activity to be performed, or it is not performed (REQUIRES HELPER).

2.0 MODIFIED DEPENDENCE--The subject expends half (50%) or more of the effort. The levels of assistance required are:

- 2.0 Supervision--subject requires no more help than cuing or coaxing, without physical contact.
- 1.7 Minimal assistance--subject requires no more help than touching, or subject expends 75% or more of the effort.
- 1.3 Moderate assistance--subject requires more help than touching, or expends half (50%) or more (up to 75%) of the effort.

1.0 COMPLETE DEPENDENCE--The subject expends less than half (less than 50%) of the effort. Maximal or total assistance is required, or the activity is not performed. The levels of assistance required are:

- 1.0 Maximal assistance--subject expends less than 50% of the effort, but at least 25%.
- 0.5 Total assistance--subject expends less than 25% of the effort.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) ITEMS

PERSONAL CARE ACTIVITIES

SELF CARE

A. **FEEDING** Includes all aspects of eating and drinking including opening containers, pouring liquids, cutting meat, buttering bread, chewing, and swallowing.

4. Complete Independence--Eats from a dish and drinks from a cup presented in the customary manner on a table or tray, opens a milk carton, pours liquids, cuts meat, and butter's bread.

3. Modified Independence--Requires prior preparation such as opening cartons, pouring liquid, cutting meat, or buttering bread before drinking or eating or requires an adaptive or assistive device such as a straw, spork, rocking knife, takes more than reasonable time, but manages meals without a helper <u>during</u> mealtime.

2. Modified Dependence--Drinks and takes full meals by mouth (i.e., chews and swallows), but requires supervision (e.g., standby, cuing, or coaxing) and/or requires minimal or moderate physical assistance during the activity of drinking or eating. The subject does not rely on other means of alimentation such as parenteral or gastrostomy feedings.

1. Complete Dependence--Requires maximal or total assistance for feeding or does not drink or take full meals by mouth but must rely at least in part on other means of alimentation such as parenteral or gastrostomy feedings.

Example for Level 3: Another person opens milk carton and leaves it in refrigerator in the morning or the night before.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

B. **GROOMING** Includes oral care, hair grooming, washing hands and face, and either shaving or applying make-up.

4. Complete Independence--Cleans teeth or dentures, combs or brushes hair, washes hands and face, shaves, applies make-up, including all preparations. Performs grooming activities safely in a reasonable period of time.

3. Modified Independence--As above but requires prior preparation, adaptive or assistive device, or takes more than a reasonable time.

2. Modified Dependence--Requires supervision (e.g., standby, cuing or coaxing) and/or minimal or moderate assistance during grooming activities.

1. Complete Dependence--Requires maximal or total assistance, or grooming is not performed.

C. **BATHING** Includes bathing the body from the neck down (tub, shower, or bed bath).

4. Complete Independence--Bathes and dries the body from the neck down.

3. Modified Independence--As above but requires adaptive or assistive device, takes more than a reasonable time, or there are safety considerations.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance during washing and drying.

1. Complete Dependence--Requires maximal or total assistance, or bathing is not performed.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

D. DRESSING - UPPER BODY Includes dressing above the waist as well as donning and removing prosthesis or orthosis when applicable.

4. Complete Independence--Dresses and undresses including obtaining clothes from their customary places such as drawers and closets; manages bra, pull-over garment, and front-opening garment; manages zippers, buttons, and snaps; dons and removes prosthesis or orthosis when applicable.

3. Modified Independence--As above, but requires prior retrieval or arrangement of clothes before dressing, or uses special adaptive closure such as velcro, or assistive device, or takes more than a reasonable time.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance during dressing.

1. Complete Dependence--Requires maximal or total assistance, or dressing is not performed.

Example for Level 3: Another person lays out clothes the night before.

E. DRESSING - LOWER BODY Includes dressing from the waist down as well as donning or removing prosthesis or orthosis when applicable.

4. Complete Independence--Dresses and undresses including obtaining clothes from their customary places, manages underpants, slacks, skirt, belt, stockings, and shoes; manages zipper, buttons, and snaps; dons and removes prosthesis or orthosis when applicable.

3. Modified Independence--As above, but requires prior retrieval or arrangement of clothes before dressing, or uses special adaptive closure such as velcro, or assistive device, or takes more than a reasonable time.

2. Modified Dependence--Requires supervision (e.g., standby, cuing or coaxing) and/or minimal or moderate assistance during dressing.

1. Complete Dependence--Requires maximal or total assistance, or dressing is not performed.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

F. **TOILETING** Includes maintaining perineal hygiene and adjusting clothing after toileting.

4. Complete Independence--Cleanses self after voiding or bowel evacuation; puts on sanitary napkins/inserts tampons; adjusts clothing after using toilet.

3. Modified Independence--As above with adaptive equipment, or takes more than a reasonable time.

2. Modified Dependence--Requires supervision (e.g., standby, cuing or coaxing) and/or minimal or moderate assistance in using toilet paper, or in perineal hygiene, or in adjusting clothes.

1. Complete Dependence--Requires maximal or total assistance.

SPHINCTER CONTROL

G. **BLADDER MANAGEMENT** Includes complete intentional control of urinary bladder and management of equipment necessary for emptying bladder.

4. Complete Independence--Controls bladder completely and intentionally and is never incontinent.

3. Modified Independence--Requires a catheter, urinary collecting device, or urinary diversion or uses medication for control; if catheter is used, the individual instills or irrigates catheter without assistance; cleans, sterilizes, and sets up the equipment for irrigation witnout assistance. If the individual uses a device, he/she assembles and applies condom drainage or an ileal appliance without assistance of another person; empties, puts on, removes, and cleans leg bag or empties and cleans ileal appliance bag. No accidents.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance for the individual to maintain a satisfactory voiding pattern or to maintain an external device; or because of the lapse of time to get to bed pan or the toilet the individual has occasional sphincter accidents, but not on a daily basis.

1. Complete Dependence--Requires maximum or total assistance. Despite assistance the individual is wet on a frequent or almost daily basis, necessitating wearing diapers or other absorbent pads, whether or not a catheter or ostomy device is in place.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

H. **BOWEL MANAGEMENT** Includes complete intentional control of bowel movement and use of laxatives, suppositories, and manual evacuation.

4. Complete Independence--Controls bowels completely and intentionally and is never incontinent.

3. Modified Independence--Uses digital stimulation or stool softeners, suppositories, laxatives, or enemas on a regular basis if needed, or uses other medications for control. If the individual has a colostomy, he/she maintains it. No accidents. Assistance of another person is not required.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance to maintain a satisfactory excretion pattern by using such means as suppositories or enemas or to maintain an ostomy device; or the individual has occasional sphincter accidents, but not on a daily basis.

1. Complete Dependence--Requires maximal or total assistance. Despite assistance the individual is soiled on a frequent or almost daily basis, necessitating wearing diapers or other absorbent pads, whether or not an ostomy device is in place.

MOBILITY

I. **TRANSFERS: BED, CHAIR, WHEELCHAIR** Includes management of all aspects of transferring to and from bed, chair, or wheelchair, or coming to a standing position, if walking is the typical mode of locomotion.

4. Complete Independence--<u>If walking</u>, approaches, sits down, and gets up to a standing position from a regular chair safely; transfers from bed to chair.
<u>If in a wheelchair</u>, approaches a bed or chair, locks brakes, lifts foot rests, and safely performs either a standing pivot or sliding transfer; returns safely, changing the position of the wheelchair if necessary; removes and replaces arm rest if necessary.

3. Modified Independence--As above but requires adaptive or assistive device such as a sliding board, a lift, grab bars, or special seat or chair or brace or crutches; takes more than a reasonable time to transfer or transfer is not performed safely. Assistance of another person is not required.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance for transfer.

1. Complete Dependence--Requires maximal or total assistance, or transfer is not performed.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

J. **TRANSFER: TOILET** Includes getting on and off toilet.

4. Complete Independence--If walking, approaches, sits down on and gets up from a standard toilet safely;
   If in a wheelchair, approaches toilet, locks brakes, lifts foot rests, and safely performs either a standing pivot or sliding transfer; and returns safely.

3. Modified Independence--As above but requires adaptive or assistive device such as a sliding board, a lift, grab bars, or special seat, or takes more than a reasonable time to complete transfer, or transfer is not performed safely. Assistance of another person is not required.

2. Modified Dependence--Requires supervision (e.g., standby, cuing or coaxing) and/or minimal or moderate assistance for transfer.

1. Complete Dependence--Requires maximal or total assistance, or transfer is not performed.

K. **TRANSFERS: TUB OR SHOWER** Includes getting into and out of a tub or shower stall.

4. Complete Independence--If walking, enters and leaves a tub or shower stall safely.
   If in a wheelchair, approaches tub or shower, locks brakes, lifts foot rests, and safely performs either a standing pivot or sliding transfer; and returns safely.

3. Modified Independence--As above, but requires adaptive or assistive device such as grab bars, special seat, or a lift, or takes more than a reasonable time, or transfer is not performed safely. Assistance of another person is not required.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance for transfer.

1. Complete Dependence--Requires maximal or total assistance, or transfer is not performed.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

LOCOMOTION

L. WALKING OR USING WHEELCHAIR Includes walking once in a standing position, or using a wheelchair, once in seated position, indoors.

4. Complete Independence--Walks a minimum of 150 feet safely without assistive devices.

3. Modified Independence--Walks a minimum of 150 feet but uses a brace (orthosis) or prosthesis on leg, special adaptive shoes, cane, crutches, or walkerette; takes more than a reasonable time; or does not walk safely, i.e., is at risk to injury.

   If not walking, operates manual or electric wheelchair independently for a minimum of 150 feet; turns around; maneuvers the chair to a table, bed, toilet; negotiates at least a 3 percent grade; maneuvers on rugs and over door sills.

Check primary mode of locomotion. If both are about equal, check W and C. ( )W = walking ( )C = wheelchair

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2. Modified Dependence--If walking, requires supervision (e.g., standby, cuing, or coaxing), minimal or moderate assistance to go as far as 150 feet, or walks independently at least 50 feet.

   If not walking, requires supervision and/or minimal or moderate assistance to go as far as 150 feet in wheelchair or operates manual or electric wheelchair independently at least 50 feet.

1. Complete Dependence--Requires maximal or total assistance to go as far as 150 feet and does not walk or operate a wheelchair as far as 50 feet independently.

H. STAIRS Includes going up and down 12 to 14 stairs (one flight) indoors.

4. Complete Independence--Goes up and down at least one flight of stairs safely without any type of handrail or support.

3. Modified Independence--Goes up and down at least one flight of stairs using side support or handrail, cane, or portable supports, which are managed without assistance of another person, takes more than reasonable time, or is not safe going up and down stairs.

2. Modified Dependence--Requires supervision (e.g., standby, cuing, or coaxing) and/or minimal or moderate assistance to go up and down one flight of stairs safely.

1. Complete Dependence--Requires maximal or total assistance or does not go up and down one flight of stairs.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

COMMUNICATION

N. **COMPREHENSION** Includes clear comprehension of either auditory or visual communication.

Check the primary mode of comprehension. If both are about equal, check A and V. ( )A = auditory ( )V = visual

---

4. Complete Independence--Follows spoken or written directions (such as three-step commands) or conversation; comprehends either spoken or written native language.

3. Modified Independence--Has difficulty following spoken or written directions (such as three-step commands) or conversation. May require a hearing or visual aid, other assistive device, or extra time to comprehend the information.

2. Modified Dependence--Does not follow directions or conversation without cues or assistance of another person, including an interpretor for the hearing impaired or a reader for the visually impaired.

1. Complete Dependence--Does not follow spoken or written directions or conversation.

Example for level 3: a visual aid is consistent use of eyeglasses

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O. **EXPRESSION** Includes clear expression of verbal or nonverbal language.

Check the primary mode of expression. If both are about equal, check V and N. ( )V = verbal ( )N = nonverbal

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4. Complete Independence--Expresses complex ideas intelligibly and fluently, verbally or nonverbally, including either signing or writing.

3. Modified Independence--Expresses complex ideas with mild difficulty but communicates basic needs and wants without difficulty. May require an augmentative communication device or system.

2. Modified Dependence--Expresses thoughts in a telegraphic or confused pattern or requires the prompts, cues, or assistance of another person.

1. Complete Dependence--Does not express basic needs and wants even with an augmentative communication device or system.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

SOCIAL COGNITION

P. SOCIAL INTERACTION Includes skills related to getting along and participating with others in therapeutic and social situations.

4. Complete Independence--Participates appropriately with staff, other patients, and family members, e.g., controls temper, accepts criticism, is aware that words and actions have an impact on others.

3. Modified Independence--Participates appropriately with staff, other patients, and family members in structured situations or modified environments. Assistance of another person is not required.

2. Modified Dependence--Unpredictable or uncooperative behavior requires assistance of another person for supervision less than half (less than 50 percent) of the time.

1. Complete Dependence--Does not function in a group/family setting or has outbursts of socially unacceptable behavior such as temper tantrums or inappropriate outbursts of laughter or crying. Requires assistance of another person for more than half (more than 50 percent) of the time.

Example for level 3: Structured situations or modified environments include rehabilitation classes, school, and workshop.

Q. PROBLEM SOLVING Includes skills related to using previously acquired knowledge to solve problems of daily living.

4. Complete Independence--In new or unfamiliar situations, applies previously acquired knowledge, initiates and carries out a sequence of steps until task is completed, and self-corrects if errors are made.

3. Modified Independence--Has some difficulty initiating, sequencing, or self-correcting. Supervision of another person is not required.

2. Modified Dependence--Problem-solves only with help of another person for supervision, coaxing, or cuing for less than half (less than 50 percent) of the time.

1. Complete Dependence--Does not problem-solve. The problem is solved by another person.

Examples: Getting food into the house either by shopping or by arranging to have the food or meals brought in or adapting to a change in hospital schedule.

FUNCTIONAL INDEPENDENCE MEASURE (FIM) (CONTINUED)

R. MEMORY Skills related to awareness in performing daily activities in an institutional or community setting.

4. Complete Independence--Recognizes people frequently encountered and remembers daily routines without cuing, prompting, or aids; executes requests of others without need for repetition.

3. Modified Independence--Has some difficulty recognizing other people, remembering daily routines and requests of others, uses self-initiated or environmental cues, prompts or aids. Reminding by another person is not required.

2. Modified Dependence--Has difficulty recognizing other people and remembering daily routines and requests of others. Requires prompting by another person less than half (less than 50 percent) of the time.

1. Complete Dependence--Does not recognize other people, remember daily routines, and requests of others. Requires supervision more than half (more than 50 percent) of the time.

APPENDIX B

FUNCTIONAL INDEPENDENCE MEASURE SCORESHEET USED ON RHODE ISLAND HOSPITAL REHABILITATION UNIT

RHODE ISLAND HOSPITAL

REHABILITATION UNIT

PATIENT NAME_____

DATE OF ADMISSION TO HOSPITAL_____

TO REHAB. UNIT_____

MEDICAL PROBLEM LIST:

SEX____(1 - Male 2 - Female)

RACE___(1 - White 2 - Black 3 - Asian 4 - Indian 5 - Other).

MARITAL STATUS_____(1 - Single 2 - Married 3 - Widowed 4 - Separated 5 - Divorced).

LIVING ARRANGEMENT AT ADMISSION

a. Setting_____
01 - Home
02 - Board and Care
03 - Transitional Living
04 - Intermediate
05 - Skilled Nursing
06 - Acute Unit -RIH
07 - Acute Unit-Another Facility
08 - Chronic Hospital
09 - Rehab. Facility-Other
10 - Other

b. Living with_____
1-Alone
2-Family
3-Relative
4-Attendant
5-Other

VOCATIONAL STATUS

a. Category_____(1-Employed 2-Sheltered 3-Student 4-Homemaker 5-Unemployed 6-Retired-Age 7-Retired-Disability)

b. Effort_____(1-Full Time 2-Part Time 3-Adjusted Workload)

FUNCTIONAL INDEPENDENCE MEASURE

FIM

LEVELS		
	4.0 Complete Independence (Timely, Safely) 3.0 Modified Independence (Device)	NO HELPER
	2.0 Modified Dependence 2.0 Supervision 1.7 Minimal Assist (Subject = 75%+) 1.3 Moderate Assist (Subject = 50%+) 1.0 Complete Dependence 1.0 Maximal Assist (Subject = 25%+) 0.5 Total Assist (Subject = 0%+)	HELPER

	ADMIT	DISCHG	FOL-UP
Self Care			
A. Feeding			
B. Grooming			
C. Bathing			
D. Dressing-Upper Body			
E. Dressing-Lower Body			
F. Toileting			
Sphincter Control			
G. Bladder Management			
H. Bowel Management			
Mobility			
Transfers:			
I. Bed, Chair, W/Chair			
J. Toilet			
K. Tub, Shower			
Locomotion	W C	W C	W C
L. Walk/wheel Chair			
M. Stairs			
Communication			
N. Comprehension	A V V S	A V V S	A V V S
O. Expression			
Social Cognition			
P. Social Interaction			
Q. Problem Solving			
R. Memory			
Total			
(Check 4- or 7-level scale) →	4 7	4 7	4 7

APPENDIX C

CRITERIA FOR REHABILITATION UNIT ACCEPTANCE

THE R.I. HOSPITAL INPATIENT REHABILITATION UNIT PROTOCOL

Introduction:

The Inpatient Rehabilitation Unit at Rhode Island Hospital offers a complete range of programs including acute medical care, medical rehabilitation care and services, consultation and diagnostic services, therapeutic evaluations and treatment, and outpatient care and follow-up.

History and Goals:

Originating in 1970 as a rehabilitation unit treating primarily patients with completed stroke, the rehabilitation unit has evolved to provide comprehensive care for individuals with complex and multifaceted impairments leading to disability and handicap. Through a multidisciplinary team effort involving health care professionals and the patient and his/her family, disability due to impairments such as neurologic injury, trauma, amputation and arthritis is reduced to a level of optimal functional independence. Adults and children receive rehabilitation services at Rhode Island Hospital, with separate areas designated for these programs in recognition of the unique care needs of each patient group.

Rehabilitation Professional Staff:

A full range of rehabilitation professionals are active in providing services within the Rehabilitation Unit. These include:

- Physiatry
- Rehabilitation Nursing
- Physical Therapy
- Occupational Therapy
- Rehabilitation Psychology
- Social Work Service
- Speech - Language Pathologists and Audiologists
- Prosthetic and Orthotic Services
- Dietician

Via consultative agreements, additional services are available in all medical specialties, as well as rehabilitation engineering and vocational counselling.

Initial evaluations by team members will commence within 48 hours of admission to the Unit. Weekly team meetings, discharge meetings, family education sessions, and "walk rounds" are conducted to ensure appropriate goal directed progress and continuous cohesive team planning and care. The schedule is as follows:

1) Walking rounds once a week on the Rehabilitation Unit (Fridays) with physiatrist, nursing staff and other team members. Patient evaluation, treatment progress and discussions preparatory to the weekly team meeting are some of the areas covered during these rounds.

2) Weekly chart rounds (Tuesdays) during which specific treatment problems and goals for individual patients will be addressed.

3) Team meeting once a week (Tuesdays): The whole rehabilitation team meets once weekly for interdisciplinary exchange of medical, social and therapy information; progress reports; disposition planning and dischage arrangements.

4) Admission review rounds (Wednesdays and p.r.n.). The physiatrist, nursing staff and other team members screen and review patient charts as well as perform clinical evaluations on patients referred for rehabilitation admission.

5) Once a week family meeting (Thursdays): Nursing, social workers, physical therapist, occupational therapist and when necessary clinical psychologist meet with family members of inpatients to discuss the medical aspects of patient's disability, review therapy and progress and discharge plans.

6) Patients who are discharged home from the Rehabilitation Unit will be seen again approximately four weeks after discharge on an outpatient basis by physiatrist, physical therapist and occupational therapy for follow-up and appropriate treatment recommendations.

Persons with disability resulting from anatomic, physiologic or neurologic dysfunction may be appropriate for intensive rehabilitation. The duration of the impairment, prognosis for physical and/or functional improvement, and the ability of the individual to participate in an intensive rehabilitation program are some of the factors related to admission to the rehabilitation unit.

Patients who are accepted to the Rehabilitation Unit must meet certain baseline criteria. These admission criteria include:

1) The patient must be medically stable and at least 16 years of age.

2) The individual must have the motivation and capacity to actively participate in a rehabilitation program which may involve three or more hours of physical rehabilitation therapies daily.

3) The patient should be alert, oriented and cooperative.

4) Substantial functional impairment due to recent onset of illness, trauma or disease progression which interferes with the patient's mobility, activities of daily living, vocation, language and coping mechanisms.

5) The patient will be able to attempt and/or assist in performance of mobility and self-care skills.

The following categories of impairment or functional level are not suitable for acute inpatient rehabilitation:

1) Patients whose intensity of medical and/or nursing care needs exclude participation and/or ability to benefit from multiple hours of rehabilitation treatments.

2) Individuals whose primary limiting factors in gaining independence are due to cognitive deficits or personality problems and do not require intensive physical rehabilitation services.

3) Those who cannot participate due to limited endurance and have a life expectency less then six months.

Acceptable Diagnoses for admission to the Rehabilitation Unit include:

1) Stroke (Cerebrovascular Accident)
2) Spinal Cord Injury
3) Traumatic Brain Injury
4) Neurologic disorders (including multiple sclerosis, polyneuropathy, myopathy, Parkinson's Disease, Guillain Barre Syndrome, etc)
5) Amputation
6) Fracture of femur with complicating medical factors (see Appendix 1)
7) Multiple Trauma
8) Congenital Malformation
9) Polyarthritis
10) Burns

Additional diagnoses including chronic pain syndromes, cardio-pulmonary disease, cancer-related syndromes and others may be appropriate for admission. Specific formal protocols for the varied diagnoses are developed or in stages of development.

The referral process for admission to the inpatient unit is primarily via transfer from a RI hospital acute medical/surgical service. Rhode Island Hospital is a member of the Center for Rehabilitation Services in Rhode Island, Inc. as well as the Rehabilitation Network of Rhode Island. As the interaction between these agencies is expanded, a system of transfer via referral from sources outside Rhode Island Hospital will be developed.

Discharge criteria for the Rehabilitation Unit are patient specific, as goals are functionally oriented. In general, individuals will be discharged from the Rehabilitation Unit when one or more of the following conditions are met:

1) Achievement of goals of optimal independence within a reasonable period of time.

2) Failure to make steady progress in rehabilitation goals such that the patient's score on a functional evaluation scale is unchanged over three or more weeks.

3) Consistently poor cooperation or motivation to participate in intensive rehabilitation efforts.

4) Medical/surgical illness or impairment that precludes participation in rehabilitation therapies.

APPENDIX D

RHODE ISLAND HOSPITAL OCCUPATIONAL THERAPY DEPARTMENT EVALUATION PROTOCOL

PROCEDURE FOR INITIAL EVALUATION

Purpose:

1. To summarize patients current hospitalization.
2. To provide information of patients post medical history.
3. To provide information regarding patients current support system.
4. To assess patients current physical, cognitive and perceptual levels of functioning as they impact on patients functional abilities.
5. To establish baseline information from which to derive a treatment plan and then reassess.

Policy:

1. All patients must have an initial evaluation when they are referred to Occupational Therapy.
2. Any patient who is referred to Occupational Therapy for a specific evaluation (i.e. The High Sensitivity Screen) or for a splint only will not require a complete initial evaluation. This must be clearly stated on the referral and in the Occupational Therapy note.

INITIAL EVALUATION

The following must be included in the initial evaluation

1. History of Present Illness (HPI).
   a. Date admitted
   b. Initial symptoms
   c. Diagnosis
   d. Results of test relevant to diagnosis
   e. Referring physician
   f. Physicians prescription

2. Past Medical History (PMH)

   a. Previous Surgeries and Dates of Occurance

   b. Previous Illnesses and Dates of Occurance

3. Precautions

   a. Medications - Heparin
      NTG
      Digoxin, etc.

   b. I.V. lines - do not range the joint associated with I.V. placement.

   c. Wound skin precautions - Read posted signs and follow instructions.

   d. Respiratory/tracheostomy

   e. Cardiac complications - Watch for S.O.B., sweating, pallor

   f. COPD - Watch for cyanosis of lips and nailbeds

   g. Metastatic cancer - no MMT

   h. Laminectomy - No weights, no pulling exercises, upper extremities not over 90°.

   i. Guillain Barre/MS - Do not over fatigue. Refer to specific protocol.

   j. Spinal cord injury - Autonomic dysreflexia, or the static hypotension, etc. Refer to SCI protocol.

   k. DVT - Do not range if there is a question of thrombosis.

   l. Watch for NPO before feeding evaluation.

4. Mental Status/Cognition

   a. Orientation

   b. Insight into illness

   c. Attention vigilance Attention to task

d. Short term memory

e. Long term memory

f. Mini mental status

g. Mental status/Cognitive screen - As indicated per above evaluations

h. High sensitivity screen - As indicated per mental status/cognitive screen

5. Upper Extremity Status

a. PRCM - Of both UE's with goniometric measurements

b. ARCM - Of both UE's with goniometric measurements

c. Strength - To be tested with MMT and graded zero to normal as appropriate. Grip and pinch strengths to be measured with dynamometer and pinch meter when hand strength is an issue.

d. Tone - Flaccid

Normal

Spastic - minimal - easily ranged past the point of the stretch reflex

moderate - difficult and slow to range past the point of the stretch reflex

maximal - impossible to range past the point of the stretch reflex

e. Sensation - Light touch
Sharp/dull
Hot/cold
Stereognosis
Two point discrimination
Proprioception

f. Fine motor coordination - Opposition
Thumb to finger tips
Handwriting
Functional pinch

4.

Perdue Pegboard - as indicated
Minnesota Rate of Manipulation - as indicated
Jebsen - as indicated

f. Orthotics - splints
casts
braces

6. Mobility

a. Bed mobility

b. Transfers

c. Ambulation

d. Sitting Balance - Static
Dynamic

e. Standing Balance - Static
Dynamic

f. Endurance

7. Communication

a. Verbal

b. Non-verbal

c. Aphasias

d. Dysarthria

e. Speech therapy involvement

8. Vision

a. Blurriness

b. Double vision

c. Hemianopsia

d. Homonymous Hemianopsia

e. Hemi-inattention

f. Glasses

9. Hearing

a. Deafness

b. Hearing aids

10. Perception

a. Body Image·Body Scheme - Somatognosia
Unilateral neglect
Anosognosia
Right Left discrimination
Finger agnosia

b. Spatial Relations - Figure ground
Form constancy
Position in space
Spatial relations
Constructional apraxia
Dressing apraxia
Topographical disorientation
Depth perception

c. Apraxia - Constructional
Dressing
Motor
Ideomotor
Ideational
Verbal

d. Agnosia - Visual object
Visual spatial
Tactile
Auditory
Apractognosia

(Extensiveness of evaluation is at the discretion of the therapist.)

11. ADL Skills - Independence, Supervision, Verbal Cue, Assistance, Dependent

    a. Oral hygiene

    b. Bathing

    c. Grooming

    d. Dressing

    e. Feeding

    f. Bed Mobility

    g. Home management - per d/c plans

    h. Home accessibility - per d/c plans

    i. Community skills

    j. Leisure activities

    k. Vocational activities

    l. Adaptive equipment

12. Short Term Goals

    Listed goals to be attained by the patient at the end of a two week period. Patient/family education must be included as a short term goal.

    (Note: STG for patients on the Rehabilitation Unit are to be attained weekly.)

13. Long Term Goals

    List goals as related to correlating STG. To be attained by D/C date.

14. Plan

    a. Briefly list methods you plan to use to achieve your goals (i.e. progressive resistive exercises, trunk control, ADL retraining, fine motor activities, etc.)

    b. List areas of evaluation that need to be completed.

    c. Include potential D/C plan and frequency of treatment for the patient.

** The following are to be included at the discretion of the therapist.

Developmental Skills

a. Perceptual/Fine motor

b. Cognition

c. Language

d. Social/Emotional

e. Self-care

f. Gross Motor

Oral-Motor

a. Tone

b. Reflexes

c. Oral structure

d. Breathing Pattern

e. Suck-swallow coordination

f. Lip control

g. Tongue position

h. Jaw control

For specific oral-motor evaluation refer to the infant/oral motor feeding evaluation form.

Revised By: Susan Short OTR/L Date Revised: 4-29-87

Approved By: Marcia Tobias, OTR/L Date Approved: 4-27-87

Reviewed By: M.G. Hannicandr, OTR/L Date Reviewed: 11-10-88

Reviewed By: _____ Date Reviewed: _____

Reviewed By: _____ Date Reviewed: _____

APPENDIX E

DATA COLLECTION SHEET

OCCUPATIONAL THERAPY FUNCTION IN SELF-CARE
FOLLOWING CEREBROVASCULAR ACCIDENT

DATA COLLECTION FORM

1. Chart Number_____(From Medical Records Chart)

(Collect Info. For Items 2-6 From RIH Data Print-Out Sheet)

AGE
2. (circle) 46-55 56-65 66-75 76-85 86-95 OTHER: younger older

INSURANCE
3. (Circle) M-Care BC/BS Other Self Pay

SIDE OF LESION
4. (Circle) Left Right Other

SECONDARY DIAGNOSES
5. (Circle) 1 2 3 4 5 6 7 8 9 10

DISCHARGE DESTINATION
6.(Circle) Home Rehabilitation Facility Nurs. Home Other

(Collect Info For Items 7&8 From Medical Records Chart)

LENGTH OF STAY
7.(Count # of treatments from check off sheet)_____.

HOURS OF TREATMENT
8. (Count # of units from check off sheet under ADL)_____U. x .5 =____hrs

(Collect Info. For Items 9&10 From Rehab Unit Files)

SELF-CARE SCORES 9. FIM	FINAL	INITIAL	CHANGE		LEVEL OF IMPAIRMENT 10. (Circle)
GROOMING	___	___	___		Admission(Initial scc
BATHING	___	___	___		SEVERE(only 2 score above 1.0)
UP. DSNG	___	___	___		MODERATE (only 2 sc below 1.3
LO DSNG	___	___	___		MILD (only 2 score below 1.7)
T. TRANSF	___	___	___		
COGNITION___			___	TOTAL	Discharge (Final scc SEVERE
					MODERATE
					MILD

APPENDIX F

RHODE ISLAND HOSPITAL HUMAN SUBJECTS COMMITTEE APPROVAL FORM

RHODE ISLAND HOSPITAL

SPONSORED PROJECT APPLICATION — ADMINISTRATION CLEARANCE FORM

PROJECT TYPE: ☐ Basic Research
☐ Clinical Research
☐ Training
☐ Clinical Care
☐ Equipment
☒ Other retrospective chart review

APPLICATION TYPE: ☑ New
☐ Continuation
☐ Renewal *(competing)*

1. Title of Project: COGNITIONAL THERAPY INTERVENTION IN SELF CARE FOLLOWING CEREBROVASCULAR ACCIDENT: IS THERE INCREASED FUNCTION?
2. Principal Investigator/Director: Gail McLaughlin,OTR/L
3. Funding Agency: None Needed
4. Duration of Project: 4 mo. years Start date: 5/1/89 End date: 8/30/89
5. Budget: N/A

	APPLICATION YEAR GRANT	APPLICATION YEAR HOSPITAL	TOTAL PROJECT GRANT	TOTAL PROJECT HOSPITAL
Direct:				
Indirect*:				
TOTAL:				

**Indirect expenses to be allocated to the project based on RIH indirect expense allocation system*

6. New Personnel Positions: N/A
7. New Space Required: N/A
8. Capital Equipment/Renovations Required: N/A

Estimated Cost:

9. **ENDORSEMENTS:**

Department Administrator — Date

Vice President/Operations — 4/28/89 Date

George Hicken, Jr. — 5/4/89 Date
Asst. Vice President/Research