

THE EFFECTIVENESS OF ACTIVITIES OF DAILY LIVING
TRAINING IN THE STROKE PATIENT

A THESIS
SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS IN OCCUPATIONAL THERAPY
IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

SCHOOL OF
OCCUPATIONAL THERAPY

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MAY, 1974

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August, 19 73

We hereby recommend that the thesis prepared under
our supervision by Bertha J. Wallace
entitled "The Effectiveness of Activities of
Daily Living Training in the Stroke Patient"

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ACKNOWLEDGMENTS

I would like to thank the Administrator and Occupational Therapists Connie Parnell and Lila Burrnell of the Fort Worth Easter Seal Society for Crippled Children and Adults; the Director of the Stroke and Neurology Unit, Presbyterian Hospital of Dallas, Dr. North; Dr. John Conwell, Neurologist, and Hospital Administrator of Presbyterian Hospital for making this research project possible.

I also owe thanks to Dr. Nancy Griffin and Dorn Long for their aid and assistance; and to my husband, Henry, who has been patient, understanding, loving and shared with me the joys and long hours of working on my research project.

The final thanks and deepest heartfilled appreciation goes to Miss Catherine Currie for her hours of untiring assistance with the editing and writing of my research project and for her words of encouragement.

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CHAPTER I

INTRODUCTION

The National Council on Rehabilitation defined rehabilitation as the restoration of the handicapped to the fullest physical, mental, social, vocational and economic usefulness of which they were capable (Willard and Spackman, 1963). Mosey (1971) stated that the growth of the rehabilitation movement between 1942 and 1960 was perhaps the most significant event influencing occupational therapy during that time interval. Mosey explained that the movement came into existence as a reaction to failures of established institutions such as the family, school, and organized medicine to provide for the disabled, and that disabled veterans returning from World War II were instrumental in bringing to the public's attention the need for effective rehabilitation services. The author further stated it had been found that with proper care, the disabled person could become an independent, contributing member of society, and that rehabilitation was economically advantageous. With emphasis on the rehabilitation movement, Mosey noted that in addition to treatment techniques in physical restoration occupational therapists became involved in prosthetic training,

construction of orthotic devices, and training in activities of daily living.

Zamir (1969) described rehabilitation as a socialization process which enabled the individual to perform normal social roles to the fullest possible extent, and stated that rehabilitation specialists such as occupational and physical therapists and rehabilitation nurses were charged with the responsibility of facilitating the reentry of an individual into vocational and other social roles. The author also stressed that the rehabilitation process, to be successful, must include total treatment of the patient and an evaluation of the effectiveness of treatment.

Bockoven (1971) described the concept of comprehensive occupational therapy in terms of "moral treatment," a philosophy based on a respect for human individuality and a fundamental perception of the individual's need to engage in creative activities. Bockoven commented that occupational therapists had shown an inborn respect for the realities of life, for the real tasks of living, and for the time it took an individual to complete a task in terms of the human context in which it was performed. The author emphasized the need for the occupational therapy profession to assert its leadership in human services programs.

Diasio (1971) reported that technological changes had affected many aspects of daily living and had also

altered health care patterns. With advances in drugs, as well as increased costs of hospital care, the length of hospitalization had been decreased for many patients, and emphasis had been placed on community health care, with occupational therapists working directly within the community.

Statement of the Problem

In historical perspectives, the life span of man has increased considerably through the ages (Zamir, 1969). In the last fifty years the population of the United States more than doubled; but in that same period the number of persons from forty to sixty-five years of age tripled, and the number of people over sixty years of age quadrupled. With the increase in life span, Bonner (1969) stated that today cerebrovascular accidents rank third as a cause of death in this country, exceeded only by cancer and heart disease. Bonner further stated that it was estimated that 1.8 million persons who had suffered a cerebrovascular accident were alive, and that statistics indicated that between 1969 and 1979 one member in every ten households would fall victim of a cerebrovascular accident.

Bonner (1969) explained that previously, when a patient suffered a cerebrovascular accident, he was taken to a general hospital for medical treatment, and afterward

might be sent to another hospital for rehabilitation in which the concept of self-care would be introduced primarily for self-feeding. Bonner reported that despite the growing acceptance of rehabilitation concepts and the establishment of rehabilitation centers throughout the country, physicians still needed practical information on the prognostic evaluation of patients having had a cerebrovascular accident.

The numbers of patients with cerebrovascular accidents within hospitals, and the increasing referrals to occupational therapy for assistance in self-help as a part of the treatment program, have demanded continued research in evaluating the effectiveness of treatment programs. The present study was undertaken to determine first, whether patients with cerebrovascular accidents, who received occupational therapy including training in activities of daily living, utilized the training after they had been discharged to the home settings; and second, if the patients regained independence or progressed toward independence in performing the activities.

Hypothesis

The study was based on the following hypothesis: Cerebrovascular accident patients receiving training in activities of daily living for more than one month will demonstrate a higher degree of carry-over of such activities

in the home setting than those patients receiving training in activities of daily living for less than one month.

Definition of Terms

The following definitions were considered pertinent to the study:

Cerebrovascular Accident: All diseases in which one or more blood vessels of the brain are primarily involved in a pathological process, any abnormality of the vascular wall, occlusion by thrombus, change in caliber of lumen, and altered permeability to plasma and blood cells (Krusen, 1971). [The term "stroke" is commonly used to refer to a cerebral vascular accident, and the two terms were used interchangeably in the study.]

Rehabilitation: A philosophy which postulates that for the patient to attain maximum recovery regardless of the cause of his condition, not only the medical aspects but also the psychosocial and the vocational aspects must be considered (Willard and Spackman, 1971).

Activities of Daily Living: Those activities necessary for the maintenance of life such as self-care activities, eating, dressing, writing, homemaking, communication, and travel (Willard and Spackman, 1971). [The abbreviation, ADL, was used to designate the term "activities of daily living."]

Limitations of the Study

The study was conducted with the following limitations:

1. Patients participating in the study were from Presbyterian Hospital, Dallas, Texas, and from the Easter Seal Society for Crippled Children and Adults, Fort Worth, Texas.

2. Patients in the study had experienced only one stroke, and the stroke had occurred between January, 1972 and April, 1973.

3. Patients in the study received ADL training in occupational therapy under either of the following plans:

- a. Out-patient treatment beginning from one to six months after onset of stroke.
- b. In-patient treatment beginning at onset of stroke.

4. The age of the patients, etiology of the stroke, and the return of motor function were not considered in the study.

Assumption

The study was based on the assumption that cerebrovascular patients having their first stroke would present similar problems in ADL training.

Procedures

The following criteria were established for the selection of patients for the study:

1. Patients who had experienced an initial stroke only between January, 1972 and April, 1973.
2. Patients who demonstrated the ability to understand and follow simple commands.

3. Patients who received occupational therapy including training in activities of daily living.

4. Patients who expressed willingness to cooperate in the study.

Each patient was evaluated at the following intervals:

1. At the beginning of treatment.
2. At discharge
3. Between three and twelve months after discharge.

Scores were assigned to specific items of the evaluation at the time of discharge and at the post-discharge evaluation. The data from the evaluation procedures were separated into two groups designated either as Group A or Group B. The data assigned to Group A were derived from the patients who received ADL training in occupational therapy for not more than one month, and data assigned to Group B were derived from the patients who received ADL training in occupational therapy for more than one month.

Analysis of the data permitted a comparison of the evaluation scores at discharge and post-discharge for each group separately, and a comparison between the groups at discharge and post-discharge evaluations. The comparisons were based on the mean scores and standard deviations computed from the evaluations for each group at discharge and at post-discharge, and the standard error of the difference

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between the means. The t test was applied to determine the statistical significance of the differences.

CHAPTER II

REVIEW OF LITERATURE

In reviewing the literature related to the present study it was noted that problems associated with training in activities of daily living were similar, regardless of the cause or extent of disability of the patients. Questions of the following types were posed: Does the patient transfer information and training techniques learned in the hospital to the home? Has the patient continued to progress in all areas of activities of daily living, or has he regressed? Does the patient use the adaptive equipment at home that was prescribed for him? What are the patient's present achievements in the area of self-care?

Because of the similarity of problems associated with ADL training among varying disability groups, the review of literature has been presented in two parts. Part A has included studies related to evaluating the effectiveness of treatment programs in activities of daily living for patients with spinal cord injury and resultant quadriplegia, children with cerebral palsy, and patients with arthritis. Part B has included studies related to stroke rehabilitation.

Part A

Lucci (1958) conducted a study to determine the levels of accomplishments and the functional capacities in ADL of adult patients with quadriplegia due to spinal cord injuries. Subjects included in the study were those with spinal injuries at levels C₄, C₅, C₆, and C₇. The patients were evaluated in the following activities: eating, drinking, combing and brushing their hair, brushing their teeth, shaving, writing, typing, turning a page, using a telephone, smoking, propelling a wheelchair, and driving a car. Eating was the first activity achieved by the patients, brushing their teeth was second, combing and brushing their hair was third, shaving was fourth, propelling a wheel chair was fifth, writing and typing were sixth. Even though eating was a complex activity due to the patient's loss of muscle power, it was first among the performances achieved by the patients.

Through evaluating daily living achievements of quadriplegics, Lucci was able to point out to the general hospital therapist the potentials of the quadriplegic in activities of daily living and the treatment techniques which had proved to be most effective.

Runge (1966) conducted a study in self-care activities for patients who had sustained spinal cord injury with

resultant quadriplegia or quadriparesis, to determine the degrees of self-care independence maintained by the patients after discharge. The patients had received their training in ADL with the assistance of splints which increased function and encouraged natural tendon tightening. It was assumed that many of the patients would no longer use their splints because the therapeutic benefit would have been achieved. The results further showed that employment after discharge had been directly related to the number of self-care activities performed rather than to the level of injury. The study also indicated a need for additional training in household activities and greater emphasis on avocational interest.

Tyler and Kogan (1965) stated that major changes in occupational therapy techniques required measurement in the effectiveness of treatment. For children with cerebral palsy reliable and better tools of assessing the growth of hands and hand skills and self-care activities were needed. Tyler devised a child's hand skill test to evaluate the ability of the pre-school cerebral palsy child to use his upper extremities. The hand skill test evaluated manipulative skills and self-help skills appropriate to each of the following age groups: 0-2 years, 2-3 years, 3-4 years and 4-7 years. Each child was evaluated and treated in

occupational therapy in one of three groups--the toddlers' group, which consisted of children under 3 years, who attended once a week; 3-6 year old group who attended one-half day sessions, five days a week; and a group of varying ages consisting of children who came to the clinic at infrequent intervals. The study was conducted over a three year period and the results were based on the scores gained in manipulative and self-help skills since initial evaluation.

The data demonstrated that the amount of therapy did not bear a systematic relationship to the improvement in manipulative skills, but was related to the score gained in self-help skills.

Gilkeson (1972) conducted a study with arthritic patients to determine the carry-over of self-care training to the home setting. The study included forty-two patients from three general hospitals. Patients were evaluated before discharge and again at one-month intervals in the patient's home after discharge. Gilkeson offered the following conclusions: (1) Training in activities of daily living was effective in comprehensive rehabilitation; (2) If motivation was not excellent, and the family was unfamiliar with the procedures, the chance of maintaining a performance level was poor; (3) Self-care training should be done in the

patient's home setting whenever possible; (4) The patient and family should work out problems, with the therapist serving as an advisor.

Nixon (1971) pointed out that with increasing emphasis on health problems, the prospect for change and growth in health services in the 1970's should result in a change in the role of the therapist. The author felt that the social policy of the country had changed, with a critical evaluation of programs, especially related to the community poor and disadvantaged, to work, to rehabilitation and to health services. Nixon stated ". . . as it is said, 'no man is an island unto himself' so must it be said that no profession in the human services, especially health services, is or can be a profession unto itself" (p. 188). Understanding and recognizing the varying needs of society and individuals should lead to the full development of particular professions.

Part B

Physicians, physical therapists, occupational therapists, nurses, speech pathologists, and educators have initiated studies to help determine factors which prove useful in evaluating the rehabilitation potential of stroke patients. When any disease entity causes disability in a large segment of the population it becomes of concern to the

community and nation. In our nation, one and a half million people are estimated to have survived a stroke and most of these have some residual disability. This disability could have been prevented in some cases and substantially reduced in others.

The human and financial cost of disability from stroke is enormous to the patient, his family and the community. Without rehabilitation after the acute episode is over, many stroke patients become dependent upon members of their family or community for the rest of their lives. With rehabilitation following the acute episode the attainment of self-care at least is usually possible. Rehabilitation of the stroke patient is needed (Stroke and Rehabilitation Monograph, 1965).

Benton and his co-authors (1971) stated that activities of daily living consist of the most common functional motor skills which are a part of the normal behavior necessary for an individual to function independently in society. The functional aspects of these skills are salient. The patient is not taught associated skills, he is taught to walk, to dress himself, and to wash his hands. Activities of daily living are correlated with motor acts, but are not identical with them. The authors further stated that Adler and Tal in 1965 had divided ADL functions into four

categories and devised a four-point scale, in terms of degrees of independence. Then the two researchers studied hemiplegic patients in terms of a four-point scale of motion impairment. On the scale one point indicated almost full range of motion and four points indicated no movement in the upper limb, no hip and ankle movements, and severe spasticity with contractures. Although the association between these two measures was highly significant in a sample of 293 patients, only 109 of the 293 cases showed exact congruence between the four-point ADL scale and the four-point motion impairment scale.

Benton, with the assistance of his co-workers (1971), reviewed the development of evaluation procedures in rehabilitation with special emphasis on ADL. The authors reported that ADL as a formal area of rehabilitation which could be measured and used as a base line for admission, evaluation of progress, and discharge from a rehabilitation program, did not gain acceptance until the 1940s. Today ADL scales are being used not only in this country but all over the world, with clinical workers typically evaluating the patient in a number of tasks and recording his performance on a form or check list. The criteria for the selection of tasks have generally involved two considerations: the task must be an important and commonly performed act which is marred by a

disabled state due to disease; and the act should be susceptible to modification by exercise, training, devices, or other means which the worker might have at hand.

As a system of evaluation, Benton et al. (1971) feels that the ADL scale has one major virtue. The individual tasks have immediate and obvious validity, as ADL tasks are intrinsically adapted to a criterion of functional daily living.

Benton and his associates further reported that three stages have been noted in reviewing the history of ADL scales. In the first stage there was an attempt to develop the scales and demonstrate their usefulness in working with the neurologically impaired. In the second stage there was an attempt to use the scales to demonstrate the usefulness of rehabilitation. In the third stage there was an attempt to use the scales as a critical indicator of the values of rehabilitation versus other forms of treatment.

Benton emphasized the need for standardized instruments to evaluate the effectiveness of programs. Recent discussions have been focused on the optimum place of treatment for the hemiplegic patient. Data derived from ADL performance scales have advocated some programs should be housed in rehabilitation settings, and in community-based programs which feature the therapist in the home. Wide

disagreement has also occurred on the number of areas of activity to be covered by an ADL scale. The most common approach has been to divide ADL into two basic areas: degree of independence of ambulation and degree of independence in self-care.

An ADL scale should be chosen with regard to reliability, validity, similarity of activity, strength, coordination and mobility requirements. The number of scale points utilized in studies of hemiplegics have ranged from 2-100 points. The most common standard has delineated success in terms of amount of assistance the individual needs to complete the act.

According to Benton and associates (1971), Schoening and his colleagues had recently developed a scale which showed the following: (1) severity of the disability was related to the amount of staff time required to assist the patient; (2) the degree of improvement was related to the duration of treatment; and (3) if the amount of assistance offered to a patient was plotted on a weekly basis, the curve for left hemiplegics would differ from the curves for the right hemiplegics. The researchers suggested that although initial and final achievements might be the same, different processes would be taking place.

Benton states that a number of attempts have been made to predict the success of ADL training in individuals with hemiplegia. Predications have been generated relating to such measures as age, presence of previous cerebrovascular accident, time since onset of disability, indices of neurological deficits including mental confusion, sensory deficits and incontinence, and the results of psychological tests of performance nature. Other predictions have been related to success in ambulation and duration of rehabilitation treatment.

Howard (1971) reported that activities of daily living have served to train the patient to adapt to different environments, but many practical adaptations have also been made to the patient's specific environment. Howard also stressed that to stimulate and teach the patient in terms of daily necessities is not something that just happens, or that is picked up naturally by the patient. It must be carefully planned and practiced, and the teaching toward this end should be recognized as an important program.

Newman (1972) conducted a study that included thirty-nine patients with hemiplegia due to cerebral infarction to determine their process of recovery after a stroke. He followed the patients from time of onset to a period of at least twenty weeks after onset. The patients were selected

on the basis of freedom from serious concomitant disease, but having neurological disability persisting at least four weeks. All of the patients were transferred to the rehabilitation hospital within four weeks of the onset of the stroke. Scales were established to measure function and success for the neurological findings and the patient's functional abilities. The patient received a neurological score based on a nine-point scale and a functional score based on a four-point scale. The neurological scores ranged from 2-9 points and were established as follows:

- 9 points--upper extremities function
- 9 points--lower extremities function
- 2 points--sensory
- 2-6 points--mental function
- 3 points--speech

The functional scores ranged from 1-4 points and were established as follows:

- 1 point--wheelchair
- 4 points--walking
- 2 points--stairs
- 3 points--dressing
- 2 points--toilet activities

The results of the study showed that neurological recovery occurred in thirty-four of the patients, and recovery begins as early as the first week and as late as the seventh week. There was minimal neurological improvement after fourteen weeks. The average recovery time interval was six weeks from onset, and the majority of the

patients reached 80 per cent final recovery.

Stern and co-workers (1971) were interested in factors which influenced stroke rehabilitation and conducted a study involving sixty-two patients hospitalized at a rehabilitation center for an average of fifty-nine days. The patients had hemiplegia or hemiparesis due to arteriosclerotic or embolic occlusion, but no cerebral hemorrhage patients were included in the study. Each patient was given a battery of tests which were as follows: quantitative test of mobility defects, leg strength measurement test, sensory test, and self-care status evaluation (numerically scored). The results disclosed that (1) 90 per cent of the stroke patients became independent in basic self-care activities and 50 per cent could be taught to do gainful work, (2) patients who had a short interval between onset of stroke and admission to the rehabilitation program improved significantly more on the paretic side than those with a longer interval, (3) patients with hemiparesis showed a greater improvement in mobility and self-care in about half the time of hospital stay, when compared with patients with hemiplegia, (4) in spite of the neurological deficits, all of the patients showed evidence of functional improvement as assessed by self-care rating scales, and (5) observations indicated that the early, functionally

oriented stroke rehabilitation program would offer the best chance of aiding the patients. Behavioral and sociological influences on the final outcome are important and must be carefully evaluated to insure maximum chances of success in rehabilitation.

Peszczymshe (1963) researched the rehabilitation potential of late adult hemiplegics. The author stated that with recent years some attempts have been made to correlate data easily available on an initial evaluation with the final results of rehabilitation. The author felt that a practical assessment of the hemiplegic was important in determining prognosis for physical rehabilitation. She devised a simplified outline to help evaluate the patient's rehabilitation potential which included the following factors: bowel incontinence, urinary incontinence, knee flexion contractures, sensory involvement, pain, motivation, special problems, upper extremity movement, gait and speech. Of these factors bowel incontinence, knee flexion contractures (20°) and lack of motivation tended to decrease the chances of successful rehabilitation. Peszczymshe further stated in her final conclusion that in assessing the patient's rehabilitation potential, it was necessary to remember each individual is markedly dependent upon his environment.

Lowenthal, Fadis and Howard (1959) conducted a study on the rehabilitation of 232 cases of cerebrovascular accidents at New York Metropolitan Hospital. The author gathered descriptive data in the early course of each case, and a functional recovery chart was made on each patient. Levels of function were listed as follows:

Independent: No significant disability, able to carry out most usual activities.

Partially Independent: Walked with cane, could carry out most usual activities.

Partially Dependent: Moderate disability, requiring some assistance in activities of daily living; walked short distances with cane.

Dependent: Bedridden, walked a few steps with assistance; incontinent, needed help in most areas.

The study indicated that there were definite problems in developing objective criteria for detecting early in the course of the illness those patients who would benefit from maximum rehabilitation care. No significance was attributed to the sex of the patient in regard to progress in the rehabilitation program.

Wylie and Baltimore (1962) conducted a study entitled "Late Survival Following Cerebrovascular Accidents." There were originally 612 patients of whom 294 survived the first week of hospitalization. Of these, 50 per cent survived fourteen weeks. Thrombosis of the middle cerebral artery and hemorrhage accounted for 82 per cent of the cases.

The median age was sixty-two years with 24 per cent of the cases being women and 76 per cent being men. The mortality rate increased with age and was not dependent on the side of the body affected. Increased mortality was noted in patients who had high blood pressure and an abnormal electrocardiogram. Patients whose disability at admission was minimal with unilateral involvement, or a high score for performance on ADL, had the greatest rehabilitation potential. The authors felt that rehabilitation programs were more successful if the patients were selected from those with the following characteristics:

1. age below 55
2. minimal disability
3. diastolic pressure of 100 or less
4. normal electrocardiogram

Jacobs and co-workers (1961) studied the rehabilitation process among patients with both physical and mental impairment, stating that it was important to help patients set realistic goals which could be achieved. With a deep understanding of human nature and its psychological defenses, the disabled individual could regain a desire for self regard and personal integrity, and could realize his fullest potentials in coping with the problems of life.

Olsen and May (1966) have researched the area of family involvement in the patient's rehabilitation program. They found the patient's strongest support was his family.

Numerous books, pamphlets and seminars on the care of stroke patients have been available for physicians, therapists and other personnel, but little has been written about the education of the family members. The patient's level of independence or dependence has depended on the family's attitude, approach and guidance. The authors found that group meetings held every four-to-six weeks with patients and their families after discharge helped the rehabilitation program greatly.

The studies of Bonner, Lucci, Runge, Tyler, Gilkeson and others pointed out the following factors to remember in the rehabilitation of patients:

1. The physically disabled have a high potential level and should be given the opportunity to achieve.
2. The family plays an important role in the patient's rehabilitation program.
3. The development of both effective evaluation tools and treatment techniques are necessary to maintain optimum patient care.

CHAPTER III

METHODS AND PROCEDURES

Selection of Patients

The twenty-two patients included in the study were selected from two area treatment facilities: Presbyterian Hospital of Dallas, Texas, classified as a general hospital, and Easter Seal Society for Crippled Children and Adults of Fort Worth, Texas, an out-patient treatment facility.

The following criteria were established for the patients who participated in the study:

1. Patients who had experienced an initial stroke only between January, 1972 and April, 1973.
2. Patients who demonstrated the ability to understand and follow simple commands.
3. Patients who received occupational therapy including training in activities of daily living.
4. Patients who expressed willingness to cooperate in the study.

Initial Evaluation and Plan of Treatment

Each patient was evaluated on referral to the occupational therapy program. The initial evaluation form

was divided into four areas: activities of daily living, active and passive range of motion, muscle strength, and perceptual-motor and sensory responses (see Appendix A). Activities of daily living evaluation included bathing, dressing, oral hygiene, grooming, feeding, writing, transfer, and communication. The level of function of the patients was noted at the time of the evaluation as Independent, Needing Assistance, or Dependent. The remaining evaluation procedures followed standard practices used in occupational therapy.

After the evaluation, a treatment program with emphasis on training in activities of daily living was planned and implemented. Each patient received occupational therapy from one to two hours, three to five days a week. A similar initial evaluation form employed by the Easter Seal Society for Crippled Children and Adults is also included in Appendix A.

Evaluation at Time of Discharge

Each patient was evaluated in activities of daily living and motor function at the time of discharge. An ADL point-scale was devised to be used with the evaluation at the time of discharge. Items from the following areas were included in the evaluation: bathing, dressing, buttoning, feeding, oral hygiene, grooming, transfer, and communication.

The evaluation was scored and a numerical value placed at the top of the evaluation form. Each patient was encouraged to practice areas in which improvement was needed, and was told that he would be contacted for a third evaluation in three to twelve months. (See Appendix B.)

Post-Discharge Evaluation

Each patient in the study was evaluated from three to twelve months after discharge. Eighteen of the twenty-two patients returned to occupational therapy for the evaluation. Four patients who had been treated at Presbyterian Hospital were unable to return for the evaluation and were sent a questionnaire which was identical to the evaluation form. The post-discharge evaluation included information about the patient's family, home situation and rehabilitation services received while hospitalized, but the data for the study were restricted to the information which evaluated the functional level of the patient, using the ADL point-scale. Items from the following areas were included in the post-discharge evaluation: hygiene, dressing, feeding, household activities, and communication (Appendix C).

Grouping of Data

Data from the evaluation forms of the patients were divided into two groups, with the length of time in therapy

being the basis for the groupings. Evaluations at time of discharge and post-discharge were conducted and rated by the researcher. Group A included the evaluation forms of twelve patients seen in therapy for not more than one month. Four of the patients were females and eight were males. The patients ranged in age from 46 years to 79 years, with a mean age of 67 years. Group B included the evaluation forms of ten patients seen in therapy for more than one month. Four of the patients were females and six were males. Patients ranged in age from 47 years to 80 years, with a mean age of 58 years.

The evaluation forms used at the time of discharge and after discharge were divided into specific areas, with related activities under each area. For example, related activities in the area of dressing included putting on trousers and putting on a pullover garment.

Determination of Progress

The number of scale points utilized in this study ranged from 1 to 216 points on the evaluation form administered at the time of discharge, and from 1 to 339 points on the evaluation form and questionnaire employed after discharge. The additional 123 points, which were allowed for those activities the patient might gain skills in after discharge, were not included in the analysis of the study.

Each score was based on the amount of assistance the patient needed to complete an activity. If the patient was unable to perform an activity, he was classified as dependent and received only one point. When a patient was able to perform an activity with assistance, he received two points. If the patient was able to perform an activity without assistance, he was classified as independent and received three points. Additional points were assigned for each activity in terms of degree of difficulty of the activity (see evaluation form point-scale in Appendixes D and E).

CHAPTER IV

ANALYSIS OF STUDY

The purpose of the study was to determine if the cerebrovascular patient continued to use activities of daily living in the home setting, and if additional skills and a higher level of independence in performing the activities were reached after discharge from treatment. The hypothesis stated that cerebrovascular accident patients receiving training in activities of daily living for more than one month will demonstrate a higher degree of carry-over of such activities in the home setting than those patients receiving training in activities of daily living for less than one month.

Tables 3 and 4, in Appendix F, show the raw scores computed for the patients in Groups A and B, respectively. The tables include the evaluation score for each patient at discharge and the evaluation score earned from three to twelve months after discharge. The highest possible score is entered at the top of the appropriate evaluation score column. The tables show that the patients in both groups showed an increase in the scores on the post-discharge evaluation.

Table 5, in Appendix F, shows a comparison of the scores of the two groups at the time of discharge and three to twelve months after discharge. The t value was then applied to determine the statistical significance of the differences between the two groups. The t value indicated that patients in Group A achieved a higher level in activities of daily living on both the discharge evaluation and the post-discharge evaluation. The score at discharge was significantly greater at .01 level of probability.

Table 6, also in Appendix F, shows the comparison of the evaluation scores at the time of discharge and after discharge for each of the two groups. The t test indicated that the patients in both Group A and Group B achieved a significantly higher level of function after discharge as compared to the level of function at the time of discharge.

To isolate the areas which showed greatest and least change in scores, a second method of analysis was employed. Each area of the ADL evaluation form administered at the time of discharge and at three to twelve months after discharge was analyzed for each group in the following manner: The number and per cent of patients who were independent in each area of an activity was determined. The results of the analysis are listed in Tables 1 and 2.

TABLE 1
PERCENTAGE OF PATIENTS INDEPENDENT IN ADL
AT DISCHARGE

Item	Group A (N=12)		Group B (N=10)	
	Number	Per Cent	Number	Per Cent
Bathing	11	92	6	60
Feeding	11	92	4	40
Oral Hygiene	11	92	6	60
Grooming	9	75	8	80
Communication	9	75	6	60
Dressing	8	67	5	50
Transfer	8	67	5	50

TABLE 2
PERCENTAGE OF PATIENTS INDEPENDENT IN ADL
AFTER DISCHARGE

Item	Group A (N=12)		Group B (N=10)	
	Number	Per Cent	Number	Per Cent
Bathing	11	92	8	80
Feeding	10	83	5	50
Oral Hygiene	12	100	8	80
Grooming	11	92	9	90
Communication	10	83	8	80
Dressing	9	73	8	80
Transfer	9	73	5	50

The lowest areas of achievement noted for Group A at the time of discharge were dressing and transfer activities; for Group B they were feeding and dressing. At the post-discharge evaluation at least 75 per cent of the patients in Group A had achieved independence in each area. In Group B 50 per cent of the patients were independent in feeding and 50 per cent were independent in transfer. At least 80 per cent of the patients were independent in the remaining activities.

The results of the study showed that patients who received training in activities of daily living for no more than one month demonstrated a higher level of carry-over of such activities to the home setting than did those patients who received training in activities of daily living for more than one month. The hypothesis, therefore, must be rejected. Additional findings from the study included the following:

1. Training in activities of daily living was effective in the treatment of the cerebrovascular accident patients in the present study.

2. Fifty per cent of the cerebrovascular accident patients who were treated either as out-patients or as in-patients showed continued improvement in all areas of activities of daily living.

3. All patients receiving training for less than one month were in-patients, and all patients receiving training for more than one month were out-patients.

4. Patients receiving training in activities of daily living from onset of stroke achieved a higher level of functioning in all areas of activities of daily living than did patients receiving identical training from one to six months after onset of stroke.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary and Conclusions

The study was undertaken to determine the effectiveness of ADL training with the cerebrovascular accident patient at the time of onset and one to six months after onset. Twenty-two patients were included in the study, twelve of whom were in-patients (Group A) and ten out-patients (Group B). All of the patients were evaluated on referral to occupational therapy, at time of discharge, and again three to twelve months later.

ADL point-scale was devised for the evaluation forms employed at time of discharge and post-discharge. Scores were computed for each group and the t test applied to determine the significant difference between the two groups (Groups A and B) in performance at time of discharge and three to twelve months later.

The results of the study showed that ADL training was effective in the treatment of cerebrovascular accident patients, and that the patient's progress depended greatly upon early treatment, rather than on the length of time in the treatment program.

Recommendations

Based on the findings of this study, the following recommendations are submitted:

1. Occupational therapy, including training in ADL, should be included in the treatment program of the patient with cerebrovascular accident as soon as possible after onset.

2. If the cerebrovascular accident patient has not received treatment in occupational therapy during hospitalization he should be referred upon discharge.

3. Dressing, feeding and transfer techniques should be emphasized early in ADL training.

4. Evaluation of the success of treatment programs and the prognosis of rehabilitation potentials might be determined by studying:

- a. the relationship between the age of the patient and the number and type of activities of daily living successfully achieved,
- b. the relationship between the rate of progress in ADL and the etiology of the cerebrovascular accident, and
- c. the rate and pattern of achievement of ADL in the patient with right hemiplegia as compared to the patient with left hemiplegia.

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APPENDIX A

EVALUATION FORMS

HEMIPLEGIC EVALUATION FORM

Name _____

Age _____ Occupation _____

Date of Admission _____ Disability _____

Dominant Extremity _____

Marital Status _____ Children _____

Interests _____

Education _____

Medical History _____

Medications _____

Re-evaluation: Dates _____

PART I

Activities of Daily Living Evaluation

Bathing

Dependent _____ Assistance Needed _____ Independent _____

Perseveration _____

Agnosia-body image _____

Dressing Upper Extremity and Lower Extremity

Dependent _____ Assistance Needed _____ Independent _____

Comments: _____

Oral Hygiene

Depen-
dent

Assis-
tance

Inde-
pendent

Brushing teeth and cleaning dentures

Removal and replacement of dentures

Observation: _____

Grooming

Shaving

Combing hair

Application of make-up

Eating

Finger-feeds

Usage of utensils

Ability to open containers

Tongue movements and chewing ability

Comments: _____

Writing _____

Patient able to use nurses call light? _____

Patient able to use telephone? _____

Patient able to transfer from bed to chair? _____

Patient able to transfer from chair to wheelchair? _____

Patient able to transfer to bath tub? _____

Patient able to transfer to toilet seat? _____

Sitting balance _____

Standing balance _____

PART II

Active Motion Test:

	Zero No vol. motion		Minimal Attempts motion		Partial 3/4 range		Good Full range	
	R	L	R	L	R	L	R	L
Reach forward								
Hand to mouth								
Reach above head								
Reach behind head								
Reach behind back								
Hand from side to lap								
Shoulder: Elevation								
Abduction								
Adduction								
Flexion								
Extension								
Hor. Abd.-sling								
Hor. Add.-sling								
Int. Rotation								
Ext. Rotation								
Elbow: Flexion								
Extension								
Forearm: Supination								
Pronation								

Comments: _____

Passive Range of Motion: (List motions that are limited, also if due to pain, or joint mobility.)

Strength:

Grade: 0 Poor Good
 Trace Fair Normal

	Right	Left
Shoulder flexors		
extensors		
Elbow flexors		
extensors		
Supinators		
Pronators		
Wrist flexors		
extensors		
Finger flexors		
extensors		
Isolated muscles when necessary:		

	Right	Left
Thumb flexors		
extensors		
opposers		

Dynamometer readings:	Right	Left
Dates		

Comments: _____

DEGREE

	Mild	Moderate	Severe
Spasticity:			
Rigidity:			

	Grasp: R L	Release: R L
Hook (suitcase)		
Spherical (ball)		
Prehension (pencil)		
Lateral prehension		
Tip prehension		

Comments: _____

Sensory Evaluation:	<u>Absent</u> R L	<u>Impaired</u> R L	<u>Intact</u> R L
---------------------	----------------------	------------------------	----------------------

Kinesthetic sense:

Shoulder (up-down, out-in)			
Elbow			
Forearm			
Wrist			
Thumb			
Fingers			

Tactile sense: Key: A=Absent, I=Impaired, In=Intact.
Use Anatomical Position

		Sharp		Dull		Lt. touch	
		R	L	R	L	R	L
Upper arm	-dorsal						
	ventral						
	lateral						
	medial						
Forearm	-dorsal						
	ventral						
	lateral						
	medial						
Hand	-dorsal						
	ventral						
	lateral						
	medial						

Stereognosis Test		Right	Left
Paper clip			
Coins			
Safety pin			
Hair pin			
Bolt			
Key			
(Sometimes Rubber band)			

Vision: Glasses
Homonymous Hemianopsia
Double Vision

Hearing:

Skin: Lesions

Speech: Aphasia
Other Speech problems

Orthotics:
Recommendations:

Mental Aspects - Impressions:

	Impairment:			
	<u>None</u>	<u>Mild</u>	<u>Mod.</u>	<u>Sev.</u>
Perceptual motor:				
Apraxia - motor				
Apraxia - ideation				
Discrimination of R & L				
Spatial orientation				
Time & place orientation				
Learning potential:				
Attention span				
Ability to recognize error				
Understand oral directions				
Understand written "				
Carry-over of dir.-memory				
Motor perseveration				
Emotional characteristics:				
Impulsivity				
Frustration/anxiety				
Lability				

Comments: _____

FORT WORTH EASTER SEAL SOCIETY FOR CRIPPLED
CHILDREN AND ADULTS

OCCUPATIONAL THERAPY

ADULT EVALUATION

Initial Date:_____

Therapist:_____

Patient's Name_____Date of Birth_____Age_____

Sex_____ Handedness_____Diagnosis_____ Onset_____

Residual Disability_____Referral Source_____

Rehabilitation History_____

Patient's Present Status

Devices Used

____Homebound
____Non-Homebound
____Ambulant
____Independent
____Assisted
____None

Wheelchair_____
Crutches_____
Cane_____
Splints_____
Adapted Utensils_____
Other_____

1. MOTIVATION

A. Behavior Response During Evaluation_____

B. Educational and Vocational Background_____

2. FUNCTIONAL EVALUATION OF UPPER EXTREMITY

A. Upper Extremity Range of Motion

MOTION	NORMAL R.O.M.	ACTIVE R.O.M.	PASSIVE	ACTIVE	PASSIVE	ACTIVE	PASSIVE
<u>SHOULDER</u>		R L	R L				
FLEXION	0-180°						
EXTENSION	0-145°						
ABDUCTION	0-180°						
ADDUCTION	0-180°						
INT. ROT.	0-90°						
EXT. ROT.	0-90°						

COMMENTS: _____

Upper Extremity Range of Motion (cont.)

MOTION	NORMAL R.O.M.	ACTIVE R.O.M.	PASSIVE	ACTIVE	PASSIVE	ACTIVE	PASSIVE
<u>FOREARM</u>							
FLEXION	0-145°						
EXTENSION	0°						
PRONATION	0-90°						
SUPINATION	0-90°						
<u>WRIST</u>							
FLEXION	0-90°						
EXTENSION	0-70°						
<u>FINGER</u>	0°						
FLEXION	mid- palm						
EXTENSION							

THUMB

Opposition-- _____

Grasp-- _____

Pinch-- _____

GENERAL STRENGTH OBSERVATIONS:_____

A.D.L. EVALUATION CHART

NAME_____Dominant hand_____

Date of Initial Test_____

Activities	Comments
1. Eat with spoon or fork_____	
2. Eat soup with spoon_____	
3. Butter bread_____	
4. Cut with knife_____	
5. Pick up glass and drink_____	
6. Eat sandwich_____	
7. Use salt shaker_____	
8. Move dishes_____	
9. Pass food at table_____	
10. Pour from pitcher_____	
11. Eat meal at dining room table_____	
12. Sit down and get up from dining table_____	

HYGIENE

1. Wash hands, face_____
2. Operate water faucets_____
3. Wring wash cloth_____
4. Brush teeth_____
5. Apply toothpaste to brush_____
6. Get into and out of shower or bath_____
7. Bathe self_____
8. Get on and off toilet_____
9. Shave or makeup_____
10. Comb or brush hair_____
11. Shampoo hair_____
12. Put up hair_____
13. Manage catheter_____
14. Clean and trim fingernails_____
15. Trim toenails_____
16. Remove-replace screw-top bottles_____

DRESSING

1. Take clothes from closet_____
2. Put on, remove button shirt_____
3. Put on, remove slacks or shorts_____
4. Put on, remove slip over garment_____

5. Put on, remove slip, bra, girdle_____
 6. Put on, remove sweater across shoulders_____
 7. Put on, remove coat_____
 8. Put on, remove socks or hose_____
 9. Put on, remove shoes or slippers_____
 10. Tie shoe laces_____
 11. Put on, remove belt_____
 12. Put on, remove watch_____
 13. Tie neck tie_____
 14. Clean glasses_____
 15. Put on, remove glasses_____
 16. Wind watch_____
 17. Put on, remove gloves_____
 18. Put object in pocket_____
 19. Remove object from pocket_____
 20. Polish shoes_____
 21. Manage button (all position)_____
 - Manage zipper_____
 - Manage safety pins_____
 - Manage straight pins_____
 22. Put on nightgown or P.J's_____
-

APPARATUS

- Put on, remove hand splints or braces_____
- Put on, remove adaptive apparatus_____
-

COMMUNICATION

1. Write name_____
2. Write letter_____
3. Position paper for writing_____
4. Stamp letter_____
5. Use eraser_____
6. Sharpen pencil_____
7. Fill pen_____
8. Handle money_____
9. Dial phone_____
10. Manage pay phone_____
11. Hold book_____
12. Handle newspaper_____
13. Wrap and tie package_____
14. Manage smoking_____
15. Manage lunch_____
16. Manage plug_____
17. Manage drawers_____
18. Manage door_____
19. Manage window_____

LOCOMOTION

1. Walks unassisted_____
 2. Uses wheelchair, crutches,
cane, or walker_____
 3. Gets in and out of bed_____
 4. Propel wheelchair_____
 5. Get in and out of chair
(all types)_____
 6. Transfer in and out of car_____
 7. Ride a bus_____
 8. Manage stepladder_____
-

HOUSEHOLD

1. Walk carrying tray with dishes_____
2. Pick up objects from floor_____
3. Carry food (item) from
and to table_____
4. Dust and wax furniture_____
5. Make bed_____
6. Clean windows_____
7. Sweep and mop floor_____
8. Vacuum_____
9. Wash, dry dishes, heavy pans_____
10. Empty trash_____
11. Wash clothes (by hand and
automatic)_____
12. Hang up wash_____
13. Iron: Sprinkle clothes_____
- Put up ironing board_____
- Pick up iron_____
- Transfer clothes to
and from board_____
14. Bathe and dress children_____
15. Prepare foods for cooking_____
16. Peel, slice or mash foods_____
- Use rolling pin_____
- Use egg beater_____
- Crack an egg_____
- Measure food_____
- Open cans and bottles_____

4. SENSORY EVALUATION

- a. Proprioception_____
 - b. Stereognosis_____
-

c. Exteroception_____

d. Other_____

5. BALANCE AND AMBULATION

6. RECOMMENDATIONS

a. O. T. Program indicated:_____

APPENDIX B

RE-EVALUATION FORM AT TIME
OF DISCHARGE

PATIENT'S EVALUATION REPORT

NAME _____ AGE _____

ADDRESS _____

TELEPHONE _____ OCCUPATION _____

ACTIVITY	D	A	I	COMMENTS
BATHING				
<u>Bedbath</u>				
<u>Tub-bath</u>				
<u>Shower</u>				
DRESSING				
UE: <u>Shirt</u>				
<u>Blouse</u>				
<u>T-Shirt</u>				
<u>Bra</u>				
<u>Dress</u>				
LE: <u>Pants</u>				
<u>Underwear</u>				
<u>Socks</u>				
<u>Stockings</u>				
<u>Button</u>				
<u>Unbutton</u>				
FEEDING				
<u>Hand used to feed self</u>				
<u>Proper use of utensils</u>				
<u>Cut food</u>				
<u>Open containers</u>				

ACTIVITY	D	A	I	COMMENTS
ORAL HYGIENE				
Brush teeth or dentures				
Remove and replace dentures				
Remove and replace toothpaste cap				
GROOMING				
Comb and brush hair				
Shave				
Put on make-up				
TRANSFER				
Into wheelchair				
Into bed from chair				
Into bathtub				
Get in and out of shower stall				
COMMUNICATION				
Use a telephone				
Use nurse call-light or button				

APPENDIX C

QUESTIONNAIRE

QUESTIONNAIRE

NAME _____ AGE _____

ADDRESS _____

TELEPHONE _____ OCCUPATION _____

THERAPIES RECEIVED IN HOSPITAL _____

PLEASE ANSWER THE FOLLOWING QUESTIONS AS ACCURATELY AS POSSIBLE

PART I

Does the patient live with relatives or in own home? _____

Number of family members living in household? _____

Are there other family members with medical problems or disabilities living within the patient's household? _____

Does the patient attend social activities or engagements? _____

Has the patient attended church services since his/her disability? _____

What physical activities does the patient participate in (golfing, swimming)? _____

Is the patient employed? _____

PART II

PATIENT OR FAMILY MEMBER SHOULD ANSWER THE FOLLOWING

Before the patient was discharged did your physician discuss possible problems that the patient may have and where to find aid and assistance if needed? _____

Did you talk with a social worker?_____

Did a nurse at the hospital discuss with you the way home
home was designed and what problems you or the patient may
have when you go home?_____

Has the patient received any therapy since discharge from the
hospital?_____

PART III

PLACE A CHECK MARK IN THE APPROPRIATE COLUMN EXPLAINING THE
PATIENT'S OR YOUR PRESENT LEVEL OF FUNCTIONING.

	No	Yes	Needs Assistance
<u>HYGIENE</u>			
1. Patient able to turn on and off faucet			
2. Shaving			
3. Make-up			
4. Washing face and hands			
5. Bathe self			
6. Get into and out of bath			
7. Get into and out of shower			
8. Get on and off toilet			
9. Comb and brush hair			
10. Brush teeth and clean dentures			
11. Remove and replace dentures			
12. Remove and replace toothpaste cap			
<u>DRESSING</u>			
13. Put on brace			
14. Put on trousers or skirt			

<u>DRESSING (Cont'd)</u>	<u>Needs</u>		
	<u>No</u>	<u>Yes</u>	<u>Assistance</u>
15. Put on pullover garments			
16. Remove pullover garments			
17. Remove trousers or skirt			
18. Put on and remove shirt or blouse			
19. Button and unbutton buttons			
20. Zip and unzip zipper			
21. Put on tie shoe or buckle shoe			
22. Remove tie shoe or buckle shoe			
23. Put on and remove slippers			
24. Put on and remove hose			
25. Put on dress			
26. Fasten and unfasten bra			
<u>FEEDING</u>			
27. Proper use of utensils			
28. Cutting food			
29. Opening containers			
<u>HOUSEHOLD</u>			
30. Open drawers			
31. Close drawers			
32. Get into and out of chair at table			
33. Get into and out of upholstered chair			

<u>COMMUNICATION</u>		No	Yes	Needs Assistance
34.	Write			
35.	Type			
36.	Use telephone			
37.	Open envelope			
38.	Place letter in envelope and seal			

APPENDIX D

EVALUATION FORM SCORING SCALE--

AT TIME OF DISCHARGE

EVALUATION FORM SCORING SCALE--

AT TIME OF DISCHARGE

Level of Function	Highest Possible Score
D--1 score	216 points
A--2 scores	
I--3 scores	

Items within each section are scored according to difficulty.

Section 1--Bathing	1	Section 4--Oral Hygiene	2
	2		2
	3		3
Section 2--Dressing		Section 5--Grooming	4
UE	2		4
	2		4
	2	Section 6--Transfer	3
	3		3
	4		4
Section 2--Dressing			4
UE	2	Section 7--Communication	3
	2		2
	3		
	3		
	4		
	4		
Section 3--Feeding	2		
	3		
	3		

APPENDIX E

EVALUATION FORM SCORING SCALE--

POST-DISCHARGE

EVALUATION FORM SCORING SCALE--

POST-DISCHARGE

Level of Function

Highest Possible Score

D--1 score

339 points

A--2 scores

I--3 scores

Items within each section are scored according to difficulty.

Section 1--Hygiene

2
4
4
2
5
4
4
3
4
2
2
3

Section 3--Feeding

2
3
3

2
2
3
4

5
6
3
3
4

Section 4--Household

Section 5--Communication

Section 2--Dressing

4
3
2
2
2
2
4
4
3
2
2
3
4
3

APPENDIX F

STATISTICAL TABLES

TABLE 3
RAW SCORES FOR GROUP A

Patient			Evaluation Score*	
Number	Age	Sex	At Time of Discharge	After Discharge
1	62	M	156	173
2	55	F	204	207
3	66	M	153	195
4	65	M	184	192
5	76	F	213	216
6	76	M	148	151
7	72	M	180	192
8	46	M	186	192
9	74	F	145	166
10	79	M	150	168
11	69	F	149	175
12	66	M	151	192

*Highest Possible Score = 216.

TABLE 4
RAW SCORES FOR GROUP B

Patient			Evaluation Score*	
Number	Age	Sex	At Time of Discharge	After Discharge
1	62	M	158	161
2	56	M	161	164
3	56	M	132	201
4	47	M	172	172
5	47	F	163	175
6	80	F	165	173
7	57	M	151	183
8	50	F	113	165
9	64	M	110	157
10	58	F	151	172

*Highest Possible Score = 216.

TABLE 5
COMPARISON OF EVALUATION SCORES FOR GROUP A AND
GROUP B AT THE TIME OF DISCHARGE AND
AFTER DISCHARGE

Evaluation Score	Group A N = 12		Group B N = 10		<u>t</u>
	Mean	Standard Deviation	Mean	Standard Deviation	
At Discharge	168	20.5	148	20.7	2.270*
After Discharge	185	18.6	172	11.9	1.805**

*P < .01.

**P < .05.

TABLE 6
COMPARISON OF EVALUATION SCORES FOR EACH
GROUP AT THE TIME OF DISCHARGE AND
AFTER DISCHARGE

Group	Evaluation Score at Discharge		Evaluation Score After Discharge		<u>t</u>
	Mean	Standard Deviation	Mean	Standard Deviation	
Group A (N=12)	168	20.5	185	18.6	2.128*
Group B (N=10)	148	20.7	172	11.9	3.191**

*P < .05.

**P < .01.