THE INFLUENCE OF SELF-EFFICACY EXPECTATIONS ON REHABILITATION OUTCOME IN SPINAL CORD INJURED INDIVIDUALS

THESIS

Presented to the Graduate Council of the North Texas State University in Partial Fulfillment of the Requirements

For the Degree of

MASTER OF SCIENCE

By

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Belanus, Anne, The Influence of Self-Efficacy Expectations on Rehabilitation Outcome in Spinal Cord Injured Individuals. Master of Science (Rehabilitation Services Administration), August, 1984, 91 pp., 7 tables, 3 illustrations, bibliography, 35 titles.

This study examined the relationship between Bandura's theory of self-efficacy and the rehabilitation outcome of spinal cord injured persons. The study elicited self-efficacy expectations from fifteen subjects on three occasions: admission and two and four weeks later. Patients rated how they expected to perform six weeks after admission on fifteen rehabilitation behaviors. Patients' ratings were compared to actual performance ratings made by the medical staff on the Barthel Index.

Results reveal that subjects' predictions two weeks and four weeks after admission were accurate ($r = .74, p < .01; r = .89, p < .001$, respectively). Findings support the limited applicability of Bandura's theory of spinal cord injury rehabilitation.

Recommendations for future research include examining variables which enhance self-efficacy and using a larger, more homogeneous sample.
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CHAPTER I

INTRODUCTION

Rationale for the Study

Spinal cord injuries affect thousands of people each year. This type of injury is traumatic both physically and psychologically. During the first few months after the injury, the spinal cord injured individual is generally involved in an extensive program of rehabilitation, usually in a large community hospital or comprehensive spinal cord injury rehabilitation facility. In spite of participating in such a program, many spinal cord injured persons do not regain independent functioning. Many require further hospitalizations for decubitus ulcers, kidney malfunctions, or remedial physical therapy.

One study shows that as many as 44 per cent of spinal cord injured persons achieve only fair or poor adjustment (5). Hallin (4), in a follow-up study of spinal cord injured persons, found that over 12 per cent suffered significant physical illnesses related to their injury. Twelve per cent suffered skin breakdowns, 15 per cent had fluid intakes below the level necessary to maintain good renal function, and almost 19 per cent had fecal accidents which could have been prevented. Hallin's study further
showed that 43 per cent required assistance in daily activities.

Yet, many individuals do succeed in hospital rehabilitation programs and go on to lead healthy, independent lives. Rehabilitation practitioners have frequently wondered why certain individuals succeed in rehabilitation while others fail. Those who succeed are generally identified as "motivated" while those who fail are referred to as "unmotivated." Yet, Poor (7) points out that rehabilitation professionals have yet to agree on a definition of motivation. Such a concept is difficult to objectively measure. Lane and Barry (6) argue against treating motivation as some global, vaguely defined entity. They argue in favor of dealing with behavior in terms of the variables of which it is a function. Yet most attempts to identify those variables which lead to a successful rehabilitation outcome have been descriptive rather than empirically demonstrated.

One variable which has been shown experimentally to predict behavioral outcomes is identified by Albert Bandura in his theory of self-efficacy. Bandura writes, "Self-efficacy is concerned with judgments about how well one can organize and execute courses of action required to deal with prospective situations that contain many ambiguous, unpredictable, and often stressful outcomes" (2, p. 200). However, self-efficacy is not a global personality trait.
Bandura (1) asserts that expectations of efficacy do not operate apart from the situation. These expectations are behavior specific. He further asserts that expectations of self-efficacy can affect initiation and persistence of coping behavior. Yet, individuals vary in their levels of perceived efficacy due to variations in how they appraise their behavioral abilities and outcomes. Bandura (1, p. 226) goes on to write that, since efficacy judgments are defined and measured independently of performance, they provide a basis for predicting the occurrence, generality, and persistence of coping behavior. The initial study by Bandura, Adams, and Beyer (3) demonstrated that perceived self-efficacy was an accurate predictor of performance even in a situation where the person had demonstrated no prior overt coping experience. Other studies to be discussed later have also supported Bandura's theory.

Statement of the Problem

To date, no studies have been published which test Bandura's theory of self-efficacy as it applies to the initial rehabilitation of spinal cord injured individuals. There are no studies in the literature which examine the questions of whether self-efficacy expectations predict rehabilitation outcome and whether the rehabilitation process significantly alters self-efficacy expectations over time. There are no studies which examine the accuracy
of self-efficacy expectations in individuals who have suffered neuromuscular impairments.

Purpose of the Study

This study attempted (1) to determine at what point in the rehabilitation process spinal cord injured subjects would be able to predict the rehabilitation outcome behaviors they would be able to perform and (2) to determine whether the subjects' expectations coincided with the staff's ratings of their rehabilitation outcome behaviors.

Research Questions

This study attempted to answer the broad question "Do self-efficacy expectations influence the behavior of hospitalized spinal cord injured persons?" Specifically, this study attempted to answer the following two questions.

1. Do the self-efficacy expectations of spinal cord injured persons predict rehabilitation outcomes?

2. Do the self-efficacy expectations of spinal cord injured persons change over the course of rehabilitation?

Hypotheses

Based on Bandura and others' findings, the primary hypothesis of this study was as follows.

1. There will be a significant correlation between subjects' ratings of their self-efficacy in performing rehabilitation outcome behaviors and staff ratings of
subjects' rehabilitation outcome performance, as measured by the final Barthel Index.

Based on Bandura's theory that self-efficacy is enhanced by vicarious experience, performance accomplishments, and verbal persuasion, the second hypothesis tested was as follows.

II. The most highly significant correlation between subjects' ratings and staff's assessment of performance will be between the rating on Self-Efficacy Questionnaire III and the score on the final Barthel Index.

Based on Bandura's theory of self-efficacy, the third hypothesis was as follows.

III. High self-efficacy subjects will have high ratings of rehabilitation outcome as measured by the final Barthel Index, whereas low self-efficacy subjects will have correspondingly low ratings of rehabilitation outcome.

Significance of the Study

This study will be significant in that it may provide information useful in the early identification of high-risk spinal cord injured persons by identifying those with low self-efficacy expectations. Lane and Barry (6) suggest that the ability to predict outcome early in rehabilitation process is the first step toward identifying the poor-risk client. Perhaps, then, they conclude, one could devise a program to help the poor-risk person.
If self-efficacy ratings are predictive of outcome, later research can then examine how to create positive changes in self-efficacy, thereby enhancing a person's rehabilitation outcome. If self-efficacy expectations alter positively during the rehabilitation process, further study can then examine those variables which affect that change. Rehabilitation programs could be designed to enhance a person's self-efficacy expectations.

Assumptions and Limitations

It was assumed that patients would report their true self-efficacy expectations on each administration of the Self-Efficacy Questionnaire.

This study was limited to examining the influence of the spinal cord injured persons' self-efficacy expectations upon their behaviors during the initial six weeks of rehabilitation.
CHAPTER BIBLIOGRAPHY


CHAPTER II

REVIEW OF RELATED LITERATURE

Research on Bandura's Theory of Self-Efficacy

Overview of Bandura's Theory

Bandura's (1) theory proposes a central processor of efficacy information whereby individuals process, weigh, and integrate diverse sources of information about their capabilities. They then regulate their behavior accordingly. Bandura distinguishes between outcome expectancies and efficacy expectancies by writing that an individual can believe that a particular course of action will produce a certain outcome while doubting whether he can personally perform those behaviors. Efficacy expectations differ along the dimensions of magnitude, generality, and strength. Further, Bandura (2, pp. 202-203) identifies four sources of self-efficacy information: vicarious experience, performance accomplishments, verbal persuasion, and physiological arousal. Simply stated, Bandura's theory states that one's assessment of one's own ability can predict one's behavior in a given situation.
Studies Involving Self-Efficacy

To date, a number of studies have confirmed Bandura's theory of self-efficacy. Bandura's (2) initial study with snake phobics had subjects rate their performance on an ordered list of 18 tasks. His results showed that the stronger the efficacy expectations, the higher the likelihood a task would be successfully completed. Bandura, Adams, and Beyer (3) also found the same results with snake phobics. Further, they found that participant modeling and vicarious modeling significantly increased the level of self-efficacy. The findings in a study by Bandura, Adams, Hardy, and Howells (4) involving agoraphobics also support the theory of self-efficacy. Sappington, Russell, Triplett, and Goodwin (23), working with snake phobics, found that emotionally based and intellectually based self-efficacy expectancies correlated significantly with behavior. Their results showed that self-efficacy expectancies are better predictors of outcome than response-outcome expectancies. Response-outcome expectancies are beliefs about the consequences of a given behavior; self-efficacy expectancies are beliefs about one's own ability to perform that behavior. Bandura, Reese, and Adams (5), in a study involving spider phobics, found that perceived inefficacy correlates significantly with physiological measures of anxiety regardless of performance.
Other researchers have sought to apply Bandura's theory to behaviors other than avoidance type. Brown and Inouye (8), looking at the relationship between learned helplessness and self-efficacy, had subjects rate their own ability to solve anagrams prior to observing models fail at anagrams. Their findings reveal that the higher the subjects' expected efficacy at solving anagrams, the longer they persisted at finding solutions. Schunk (26) conducted a study involving children with poor arithmetic skills in which he found that children with higher percepts of self-efficacy subsequently persisted longer and achieved more success on arithmetic tasks than their less self-efficacious counterparts. In a similar study, Bandura and Schunk (6) found that a high perception of self-efficacy was accompanied by high performance attainments and perseverance in children performing subtraction problems.

Condonette and Lichtenstein (9) investigated the role of self-efficacy in the maintenance of smoking cessation behavior. They found that the higher the level of self-efficacy at the completion of treatment, the greater the probability that subjects would remain abstinent. Higher levels of self-efficacy also led to longer periods of abstinence whereas low levels of self-efficacy led to sooner relapse. Weinberg, Gould, and Jackson (29), in a study of the relationship between self-efficacy expectations and
competitive motor performance, found that high self-efficacy subjects extended their legs significantly longer than low self-efficacy subjects. Their study demonstrated that higher self-efficacy subjects persisted significantly longer on trial two after failing trial one.

Research on Factors Leading to Successful Outcome in Spinal Cord Injury Rehabilitation

A review of the literature concerning factors predictive of rehabilitation success among spinal cord injured persons reveals an almost complete lack of objective research. Most articles are primarily theoretical and subjective. Much of this theorizing deals with motivation. Many writers assume that high motivation is the determining factor in rehabilitation success. They attempt to discover those variables which lead to high motivation. Barry, Dunteman, and Webb (7) attempted to measure motivation based on psychological test data and psychologist's rating of motivation. They found that subjectively rated patient motivation was associated with a favorable attitude toward oneself and a small discrepancy between ratings of self and ideal self. They did not correlate motivation with outcome. Fogel and Rosillo (14), using subjective ratings by psychiatrists compared to rehabilitation success as rated by the patient's physiatrist, considered the following variables: morale, motivation for recovery, family
structure, attitude toward treatment and staff, and degree of flexibility of life goals. They discovered the following significant predictors of outcome: overall morale in males, degree of hope in the staff and the program, motivation for recovery in males, and flexibility in life goals in males. Again, these ratings were made subjectively through interviews with the patients.

Salomone (22) conducted a study to determine whether clients judged motivated are likely to become employed and to determine whether personality variables differentiated motivated from unmotivated. He found that global ratings of motivation were not predictive of vocational rehabilitation outcome and that personality variables do not predict motivation. Cook's (10) research confirmed these findings. Spinal cord injured clients are not motivationally homogeneous. He suggests that future research focus not on motivation but on the prediction of performance in various rehabilitation tasks.

Other researchers have examined the influence of emotions in the rehabilitation outcome of spinal cord injured persons. Heijm and Granger (16) theorize that one cause of failure is depression. Dinardo's (12) research confirms this theory. He found that absence of depression favors good adjustment to spinal cord injury while those who react with depression are less well adjusted at any given point.
Diamond, Weiss, and Grynbaum (11) evaluated the influence of attitude upon the degree of participation in physical therapy. They discovered that participation is related to a positive, future-oriented attitude whereas non-participation is related to a negative, resigned attitude. This study did not correlate participation with rehabilitation outcome.

Swenson (27) examined the relationship between locus of control and rehabilitation outcome among spinal cord injured. His results revealed that those classified as internals spent less time in hospitals as a result of non-hygienic behaviors. Internals also developed fewer decubitus ulcers. They were more satisfied with life and spent more time in work activities, education, and community work. Swenson's work is among the few concrete attempts to identify personality variables which predict successful outcome. However, as Bandura (2) points out, locus of control is different from self-efficacy. Locus of control theory involves determining whether a person believes that a certain outcome is determined by one's own actions or by external forces beyond one's control. Self-efficacy theory involves examining the relationship between what one believes one can do and what one actually does. Attributions of control would affect self-efficacy, but simply measuring
locus of control would not give one information regarding one's beliefs about one's ability to perform.

Other researchers have tried to identify demographic or behavioral variables which predict successful rehabilitation outcome. Diamond, Weiss, and Grynbaum (11) found that participation in rehabilitation could not be predicted from age, sex, race, education, work history, religion, marital status, financial support, diagnosis, ambulatory status, or prognosis. Forer and Miller (15) found that successful rehabilitation outcome is positively related to high scores in bladder management. Norris-Baker, Stephens, Rintala, and Willems (21) found that the higher the patients' behavioral diversity and independence in therapy, the less likely patients were to experience readmission for remedial treatment. Their study also revealed that those who were more mobile in the hospital, as defined by wheelchair odometer readings, were more likely to participate in the community after discharge. Neither of these studies examined causes for the identified behaviors.

Writers such as Trieschmann (28) and Margolin (20) assert that rehabilitation failures are not due to variables within the person. Instead, they identify such environmental variables as poor hospital services, improper rewards, and lack of integrated delivery systems. These authors lay blame for failures in rehabilitation with the environment.
They offer no empirical evidence to support their contention, however.

As seems evident from the reviewed literature, few objectively defined and measurable data exist which identify factors that can predict rehabilitation outcome. This study attempted to determine whether an individual's ratings of self-efficacy expectations are predictive of rehabilitative outcome.

Assessment of Rehabilitation Outcome

A problem common to all studies regarding rehabilitation outcome is how to evaluate success and failure. Some authors have used subjective physicians' ratings (14, 16, 18). Others have used hospital readmissions as indicative of rehabilitation failures (21, 27). None of the studies reviewed correlated rehabilitation success with presently existing scales which rate patients on functional abilities. In an effort to assess outcome using an objective scale, this investigator evaluated several scales currently used in rating rehabilitation outcome.

Hoff and Mead (17) developed a scale consisting of mobility and activities of daily living items. This instrument compared therapists' ratings of what a person should be able to do with what he was actually able to do. Dinnerstein, Lowenthal, and Dexter (13) produced a very task-specific scale which covered eleven areas of
functioning and included 66 different behaviors. Schoening and Iversen (25) reported on the Kenny Self-Care Evaluation, which examined seventeen self-care activities broken down into 100 behaviors. Sarno, Sarno, and Levita (24) devised the Functional Life Scale, which is a self-report instrument consisting of five categories of behaviors with 44 different items to be rated.

By far the simplest index of rehabilitation outcome is the Barthel Index, described by Mahoney and Barthel (19) in 1965. The index (Appendix A) consists of fifteen items which assess a patient's functioning. The items include basic activities of daily living such as eating, dressing, grooming, and toileting as well as mobility independence items. The items are differentially weighted according to the importance of the task for functional independence (Appendix B). The scale goes from 0 to 105, with the higher scores signifying greater independence. The Barthel Index will be described in more complete detail in the design section of this paper. It was chosen for use in this study for its brevity and clarity when compared to the above described instruments and for reasons which will be described in the design description.
CHAPTER BIBLIOGRAPHY


CHAPTER III

DESIGN OF THE STUDY

Subjects

The fifteen subjects participating in this study were recent spinal cord injured patients who were admitted to initial rehabilitation at Swiss Avenue Hospital in Dallas, Texas and Dallas Rehabilitation Institute in Dallas, Texas. A letter of permission to use subjects at Swiss Avenue Hospital is presented in Appendix C. Verbal permission was given to use subjects at Dallas Rehabilitation Institute by its medical director, Dr. George Wharton. The Institutional Review Board of North Texas State University approved the use of human subjects in this study (Appendix D).

Demographic information on the subjects is summarized in Table I. Subjects ranged in age from 14 to 71, with a mean age of 32.2 (SD = 14.26). Twelve of the patients in the study were from Swiss Avenue Hospital. The other three were from Dallas Rehabilitation Institute.

Development of Instruments

In developing a valid instrument to measure self-efficacy expectations regarding one's ability to perform behaviors which are necessary for success in rehabilitation,
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This investigator evaluated existing rehabilitation scales against the criteria suggested by Bandura (1). He defines an efficacy expectation as the conviction that one can successfully execute the behaviors required to produce an outcome. He states that one must analyze those behaviors which are necessary in producing the desired outcome. These behaviors need to be ordered by the level of difficulty, as some people may feel able to perform only the simple tasks. Bandura asserts that efficacy expectations should be evaluated apart from performance. Further, efficacy expectations need to be assessed at significant junctures since one's expectations can be altered by the cumulative effects of one's effort. From Bandura's guidelines, the following criteria were developed: (1) the instrument must be behavior specific, (2) it must include behaviors which are shown to be necessary for successful rehabilitation outcome, (3) the assessment must include simple as well as difficult tasks,
(4) self-efficacy expectations must be evaluated apart from actual performance evaluations, and (5) these expectations need to be measured at significant junctures during the rehabilitation process.

The Barthel Index (6) was chosen for adaptation as a self-efficacy measure (Appendix A). This index includes fifteen self-care and mobility items. It includes simple items such as drinking from a cup as well as more difficult items such as walking fifty yards on the level. The items are weighted according to their importance in functional independence (Appendix B).

This instrument has been demonstrated to be a valid and reliable measure of rehabilitation outcome. Donaldson, Wagner, and Gresham (2) examined the Kenny Self-Care Scores, the Katz Index ratings, and the Barthel Index ratings for 100 patients. The researchers collected two sets of scores for each patient at a one-month interval. They found that the scores for 68 patients moved in a parallel fashion. Twenty-four sets of scores moved in an expected divergent fashion since the Barthel and the Kenny Self-Care Index were more sensitive to small changes than the Katz Index. In all, 92 sets of scores showed expected patterns. Although the Kenny Self-Care Evaluation was the most sensitive to change, it was not chosen for use in the present study because it does not take continence into account.
Granger and Greer (4) found a close correlation between the Barthel Index discharge scores, the PULSES discharge scores, and actual discharge outcomes for 500 patients. Granger, Albrecht, and Hamilton (3) correlated scores on the PULSES and the Barthel Index for over 300 patients. They found correlations at admission of .79, at discharge of .74, and at follow-up of .80, all significant at $p < 0.001$. Further, they found the Barthel Index to have a test-retest reliability equal to 0.89 and an inter-coder reliability of 0.95. These authors suggest that the Barthel Index be used for assessing general functional performance prior to, during, and following rehabilitation.

This investigator adapted the version of the Barthel Index described by Granger, Albrecht, and Hamilton (3), using the descriptions originally proposed by Mahoney and Barthel (6) in order to make clear such items as grooming and controlling elimination. On items eight, nine, thirteen, and fourteen, the suggestion by Granger, Albrecht, and Hamilton (3, p. 154) to employ four levels of functioning instead of three was utilized. In each case, the additional item assesses independence using some type of assistive or adaptive device. This extra item is weighted identically with the item for independence without a mechanical device. On item ten, this researcher used Mahoney and Barthel's (6) original version as it
distinguishes between those who are able to sit but cannot transfer. The Granger version does not make this important distinction.

The Self-Efficacy Questionnaire (Appendix E) consists of the fifteen Barthel Index items with the following statement preceding each item: "I believe that I will be able to . . . ." The Background Information sheet (Appendix F) is aimed at gaining descriptive data on each subject. The cord level categories are based on Kevorkian's (5) suggestion to have the categories reflect functional levels.

Procedure for Collection of Data

The procedure for the collection of data differed between the two hospitals used in the study. At Swiss Avenue Hospital, the following procedure was followed.

1. Each patient admitted for initial spinal cord injury rehabilitation was given the opportunity to participate in the study.

2. Patients whose cognitive abilities were impaired as a result of a concomitant head injury or senility were excluded from the study. This decision was made by the investigator after consulting the patient's physician.

3. Each patient who agreed to participate in the study was read the Subject Consent for Participation in Research (Appendix G) and asked to sign a copy of it.
4. Each patient was then asked to complete a Self-Efficacy Questionnaire and Background Information sheet. Responses were given verbally and were recorded by the investigator.

5. At two weeks and four weeks after the initial Self-Efficacy Questionnaire was completed, the patient was asked to complete another Questionnaire.

6. The physical therapist and aide assigned to each patient were asked to rate the person's initial level of functioning using the Barthel Index.

7. Six weeks after the initial rating, the same therapist and aide were asked to complete another Barthel Index.

8. To protect confidentiality, each patient was assigned a number from one to twelve on a master list. The Background Information sheet and all Self-Efficacy Questionnaires were identified only by this number. The Barthel Index had the patient's name but no number.

The procedure followed at Dallas Rehabilitation Institute was as follows.

1. Each patient admitted for initial spinal cord injury rehabilitation was given the opportunity to participate in the study.

2. Patients whose cognitive abilities were impaired as a result of a concomitant head injury or senility were
excluded from the study. This decision was made by the psychologist assigned to the subject.

3. Each patient who agreed to participate in the study was read the Subject Consent for Participation in Research (Appendix H).

4. Each patient was then asked to complete a Self-Efficacy Questionnaire and Background Information sheet. Responses were given verbally and were recorded by the patient's psychologist.

5. At two weeks and four weeks after the initial Self-Efficacy Questionnaire was completed, the patient was asked to complete another Questionnaire.

6. Upon admission, the Barthel Index was completed by the psychologist assigned to the subject after receiving input during a case conference with the patient's physician, nursing staff, and therapy staff.

7. Six weeks after the initial rating, the psychologist again completed a Barthel Index based on the input received at a case conference.

8. To protect confidentiality, the patient's hospital number was used on each Self-Efficacy Questionnaire and on the Background Information sheet. The Barthel Index had the patient's name but no number.
CHAPTER BIBLIOGRAPHY


CHAPTER IV

RESULTS OF THE STUDY

Scoring of Instruments

Using the scoring for the Barthel Index (Appendix B), a score was calculated for each administration of the Self-Efficacy Questionnaire and for each Barthel Index. For each subject from Swiss Avenue Hospital for whom two independent Barthel Index ratings were made by a therapist and an aide, the two ratings were averaged to yield a single Barthel Index score. For those subjects from Dallas Rehabilitation Institute, only the one team rating was used for the Barthel Index score. Table II contains the scores for each subject on the three Self-Efficacy Questionnaires and the two Barthel Indexes. A more detailed description of responses to each instrument is contained in Appendix I.

Staff ratings for each subject are detailed in Table III. In order to determine the degree to which the two independent Barthel Index ratings were correlated, Pearson Product Moment Correlation Coefficients (r) were calculated for both the Barthel Index at admission and the one after six weeks. Scores for subjects with a team rating or where data were missing were omitted when the Pearson r's were calculated. The formula cited by Cohen
TABLE II
PATIENT SCORES ON SELF-EFFICACY QUESTIONNAIRES AND BARTHEL INDEXES

Patient Number | Self-Efficacy Questionnaires | Barthel Indexes |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Within Three Days</td>
<td>Two Weeks</td>
</tr>
<tr>
<td>1</td>
<td>73</td>
<td>63</td>
</tr>
<tr>
<td>2</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>3</td>
<td>81</td>
<td>95</td>
</tr>
<tr>
<td>4</td>
<td>94</td>
<td>71</td>
</tr>
<tr>
<td>5</td>
<td>105</td>
<td>79</td>
</tr>
<tr>
<td>6</td>
<td>79</td>
<td>47</td>
</tr>
<tr>
<td>7</td>
<td>92</td>
<td>29</td>
</tr>
<tr>
<td>8</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>9</td>
<td>72</td>
<td>50</td>
</tr>
<tr>
<td>10</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>11</td>
<td>84</td>
<td>53</td>
</tr>
<tr>
<td>12</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>13*</td>
<td>79</td>
<td>33</td>
</tr>
<tr>
<td>14*</td>
<td>47</td>
<td>40</td>
</tr>
<tr>
<td>15*</td>
<td>78</td>
<td>80</td>
</tr>
</tbody>
</table>

*Patients at Dallas Rehabilitation Institute.

...and Cohen (1, p. 35) was used to calculate the reliability coefficients. A Student's t was calculated for each coefficient to determine its significance (1, p. 49). On the initial Barthel Index, the reliability coefficient was $r = .91$, significant to $p < .001$ ($N = 12$). On the final Barthel Index, the reliability coefficient was $r = .98$, significant to $p < .001$ ($N = 11$).

In order to determine whether the two samples consisting of (1) the patients from Swiss Avenue Hospital...
TABLE III

STAFF RATINGS ON THE BARTHEL INDEX

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>Barthel Index at Admission</th>
<th>Barthel Index after Six Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Therapist</td>
<td>Aide</td>
</tr>
<tr>
<td>1</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>33</td>
<td>40</td>
</tr>
<tr>
<td>3</td>
<td>63</td>
<td>57</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>40</td>
<td>51</td>
</tr>
<tr>
<td>6</td>
<td>23</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>45</td>
<td>47</td>
</tr>
<tr>
<td>9</td>
<td>20</td>
<td>38</td>
</tr>
<tr>
<td>10</td>
<td>80</td>
<td>65</td>
</tr>
<tr>
<td>11</td>
<td>13</td>
<td>28</td>
</tr>
<tr>
<td>12</td>
<td>79</td>
<td>88</td>
</tr>
<tr>
<td>13</td>
<td>10°</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>14°</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>43°</td>
<td></td>
</tr>
</tbody>
</table>

*Missing data.

°Team rating of patients at Dallas Rehabilitation Institute.

and (2) the patients from Dallas Rehabilitation Institute were sufficiently alike to be grouped together, means and standard deviations were calculated for the two groups. A t-test to determine the significance of the differences between means (2, p. 115) was performed for each administration of the Self-Efficacy Questionnaire and each Barthel Index. The results are summarized in Table IV.

The values in Table IV show that the differences between the two groups were not significant on any of the
TABLE IV
MEANS, STANDARD DEVIATIONS, AND t-TEST VALUES FOR THE TWO SAMPLES

<table>
<thead>
<tr>
<th>Rating/Sample</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>t-Test* Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Efficacy Admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAH*</td>
<td>85.0</td>
<td>15.67</td>
<td>1.480$</td>
</tr>
<tr>
<td>DRI†</td>
<td>68.0</td>
<td>14.85</td>
<td></td>
</tr>
<tr>
<td>At two weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAH</td>
<td>68.5</td>
<td>20.70</td>
<td>1.080</td>
</tr>
<tr>
<td>DRI</td>
<td>51.0</td>
<td>23.81</td>
<td></td>
</tr>
<tr>
<td>At four weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAH</td>
<td>59.5</td>
<td>27.96</td>
<td>0.650</td>
</tr>
<tr>
<td>DRI</td>
<td>49.7</td>
<td>17.59</td>
<td></td>
</tr>
<tr>
<td>Barthel Index Admission</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAH</td>
<td>36.2</td>
<td>24.80</td>
<td>1.080</td>
</tr>
<tr>
<td>DRI</td>
<td>22.3</td>
<td>14.70</td>
<td></td>
</tr>
<tr>
<td>At six weeks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAH</td>
<td>51.2</td>
<td>30.75</td>
<td>0.474</td>
</tr>
<tr>
<td>DRI</td>
<td>42.0</td>
<td>24.26</td>
<td></td>
</tr>
</tbody>
</table>

*d.f. = 13.
*SAH--Swiss Avenue Hospital (N = 12).
†DRI--Dallas Rehabilitation Institute (N = 3).
§All t values are not significant at p < .05.

Self-Efficacy Questionnaires nor on any of the Barthel Indexes. The data which follow combine the two samples into one group (N = 15).

Means, medians, and standard deviations were calculated for each administration of the Self-Efficacy
Questionnaire and the Barthel Index. The results are reported in Table V.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Mean</th>
<th>Median</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-Efficacy</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission</td>
<td>81.6</td>
<td>80</td>
<td>16.93</td>
</tr>
<tr>
<td>At two weeks</td>
<td>65.0</td>
<td>63</td>
<td>24.25</td>
</tr>
<tr>
<td>At four weeks</td>
<td>57.5</td>
<td>50</td>
<td>26.51</td>
</tr>
<tr>
<td><strong>Barthel Index</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission</td>
<td>33.3</td>
<td>29</td>
<td>23.94</td>
</tr>
<tr>
<td>At six weeks</td>
<td>49.4</td>
<td>46</td>
<td>29.79</td>
</tr>
</tbody>
</table>

Correlations between Self-Efficacy Scores and Barthel Index Ratings

To test the hypothesis that there would be a significant correlation between self-efficacy scores and final Barthel Index scores, Pearson Product Moment Correlation Coefficients (r) were computed between the scores on each group of Self-Efficacy Questionnaires and the scores on the final Barthel Index rating. For informational purposes, correlations were also calculated between the scores for each administration of the Self-Efficacy Questionnaire and between the scores for each administration of the Barthel Index. The raw score formula cited by Cohen
and Cohen (1, p. 35) was used to calculate the Pearson r. In order to determine the significance of each correlation, a Student's t was calculated using the formula given by Cohen and Cohen (1, p. 49). The results of these calculations are reported in Table VI.

As can be seen from the correlations recorded in Table VI, a significant correlation exists between the self-efficacy scores at two weeks and the Barthel Index ratings at six weeks ($r = .74$, $p < .01$). A significant correlation also exists between the self-efficacy scores at four weeks and the Barthel Index ratings at six weeks ($r = .89$, $p < .001$). No significant correlation was found to exist between the scores on the first Self-Efficacy Questionnaire and the final Barthel Index ratings. These results indicate that, at admission, subjects were unable to accurately predict their rehabilitation outcome six weeks later. However, within two weeks, they were able to accurately predict their rehabilitation outcome. After four weeks, subjects' expectations were even more highly correlated with their actual performance.

Another finding which further amplifies the difference between the subjects' ratings at admission and their ratings later can be found by examining the means for each of the self-efficacy ratings. At admission, subjects believed that they could perform most of the rehabilitation behaviors (mean equals 81.6). In fact, as Appendix I
TABLE VI
CORRELATION COEFFICIENT MATRIX FOR SELF-EFFICACY SCORES AND BARTHEL INDEX RATINGS

<table>
<thead>
<tr>
<th>Rating</th>
<th>Self-Efficacy Scores</th>
<th>Barthel Index Ratings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Within Three Days</td>
<td>Two Weeks</td>
</tr>
<tr>
<td>Self-efficacy scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within three days</td>
<td>...</td>
<td>.58*</td>
</tr>
<tr>
<td>Two weeks</td>
<td>.58*</td>
<td>...</td>
</tr>
<tr>
<td>Four weeks</td>
<td>.34</td>
<td>.83†</td>
</tr>
<tr>
<td>Barthel Index ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Admission</td>
<td>...</td>
<td>...</td>
</tr>
<tr>
<td>Six weeks</td>
<td>.20</td>
<td>.74°</td>
</tr>
</tbody>
</table>

*p < .05.

°p < .01.

†p < .001.

reveals, ten subjects believed that they would walk either independently or with assistance at the end of six weeks. By the time of the third Self-Efficacy Questionnaire, only four believed that they would walk independently or with help. Similar changes in expectations occurred in regard to such behaviors as dressing, bathing, bowel and bladder control, and transfers. By the second self-efficacy rating, the mean dropped to 65.0 and by the third to 57.5. The mean for the final Barthel Index was 49.4. When *t*-tests (2, p. 114) were performed to determine
whether a significant difference existed between the means for the self-efficacy scores, the results for the difference between the initial self-efficacy rating and the second and third ratings were, respectively, $t = 3.103$, $p < .01$ and $t = 5.021$, $p < .001$ (d.f. = 14). Consequently, subjects' ratings of self-efficacy did indeed change significantly from what they were at admission.

As indicated in Table VI, a highly significant correlation was found to exist between the scores on the two Barthel Index administrations ($r = .91$, $p < .001$). This high level of correlation indicates that some type of linear relationship exists between the two sets of scores. In order to determine whether this closeness was due to insignificant changes in patients' rehabilitation performance between admission and six weeks, a $t$-test for the difference between means of correlated samples was done using the formula described by McNemar (2, p. 114). Calculations reveal $t = 4.522$ (d.f. = 14); therefore, $p < .001$. These results indicate that a significant difference does exist between the Barthel Index scores at admission and the scores six weeks after admission. The high correlation merely indicates the accuracy of the regression equation for predicting the final Barthel Index score ($\hat{Y}$) from the initial Barthel Index score ($X$). That regression equation is $\hat{Y} = 1.36 (X) + 3.64$. 
Even though a significant correlation does not exist between the scores on the initial Self-Efficacy Questionnaire and the scores on the final Barthel Index, a significant correlation did appear between the scores on the first two Self-Efficacy Questionnaires ($r = .58$, $p < .05$). This significant correlation was due to the fact that the scores were linearly related even though the means were significantly different. The equation for estimating the score on the second Self-Efficacy Questionnaire ($\hat{Y}$) from a given score on the first Self-Efficacy Questionnaire ($X$) is $\hat{Y} = .828 (X) - 2.88$. This equation demonstrates that scores on the second Self-Efficacy Questionnaire were declining linearly in relation to the scores on the first Self-Efficacy Questionnaire. One could predict the lower scores using this equation.

The data in Table VI also indicate that there was a significant correlation between the scores on the second and third Self-Efficacy Questionnaires. This correlation shows that the patients' self-efficacy expectations changed relatively little between the second and third Self-Efficacy Questionnaire. No significant correlation was found to exist between the scores on the first and third Self-Efficacy Questionnaires.

The second hypothesis of this study was that the most highly significant correlation would be between the scores on the third Self-Efficacy Questionnaire and the
final Barthel Index. As the figures in Table VI show, that correlation was $r = .89$, $p < .001$. This correlation was the most highly significant correlation between the Self-Efficacy Questionnaire and the final Barthel Index rating.

To test the hypothesis that high self-efficacy subjects will have high ratings of rehabilitation outcome as measured by the final Barthel Index, whereas low self-efficacy subjects will have correspondingly low ratings of rehabilitation outcome, a two-by-two contingency table was constructed for each administration of the Self-Efficacy Questionnaire and the final Barthel Index. Scores were divided at the mean for each set of scores. Those above the mean were categorized as high, and those below the mean were categorized as low. Since some of the expected frequencies were less than 5 (expected frequencies are shown in parentheses), direct probabilities were calculated using the technique described by McNemar (2, pp. 272-275). Figure 1 displays data for the initial Self-Efficacy Questionnaire and the final Barthel Index. The exact probability for Figure 1 exceeded $p > .10$. These results indicate that the values in such a configuration do not depart significantly from those expected by chance.
Results for the second Self-Efficacy Questionnaire and the final Barthel Index are shown in Figure 2. The exact probability for Figure 2 is $p = .10$.
Data for the final Self-Efficacy Questionnaire and the final Barthel Index are contained in Figure 3. The exact probability for Figure 3 is \( p = .035 \).

**Final Barthel Index**

<table>
<thead>
<tr>
<th></th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>1 (3.2)</td>
<td>5 (2.8)</td>
</tr>
<tr>
<td>Low</td>
<td>7 (4.8)</td>
<td>2 (4.2)</td>
</tr>
</tbody>
</table>

8 7 15

Fig. 3--Contingency table for third self-efficacy scores and final Barthel Index.

These probabilities reveal that only the configuration in Figure 3 is significant at the \( p < .05 \) level. These contingency tables display the results by making artificial dichotomies of the data. Cohen and Cohen (1, pp. 299-301) recommend that dichotomizing data into two-by-two tables be used to describe data, not to analyze them, since some statistical power is lost. The significant correlations between the scores on the final Barthel Index and the scores on the second and third administrations of the Self-Efficacy Questionnaire as shown in Table VI by themselves demonstrate that low self-efficacy scores are correlated
with low rehabilitation outcomes, whereas high self-efficacy scores are correlated with high outcomes.

However, it is difficult to determine whether high self-efficacy subjects have high outcomes based solely on their expectations. Perhaps these subjects had high expectations and therefore high outcomes because of their level of injury. In order to examine that possibility, subjects were divided into two groups, quadriplegics and paraplegics, those having an injury at the C7 level or above being classified as quadriplegics. Data on the two groups are shown in Table VII.

As can be seen from the results in Table VII, the means on the first Self-Efficacy Questionnaire were very close for the quadriplegics and the paraplegics (78.2 and 83.9, respectively). A t-test for the difference between means (2, p. 115) yields \( t = .612 \) (d.f. = 13), \( p > .05 \). The initial self-efficacy scores of the paraplegics and quadriplegics were not significantly different. Early in the rehabilitation process, both quadriplegics and paraplegics believed that they would do well.

However, the differences between the quadriplegics' and the paraplegics' scores became significant at the second self-efficacy rating. The mean for the quadriplegics was 48.2 whereas that for the paraplegics was 76.2. A t-test for the significance of the difference between means reveals \( t = 2.660 \) (d.f. = 13), \( p < .02 \). Similarly,
TABLE VII
QUADRIPLEGICS' AND PARAPLEGICS' SCORES ON SELF-EFFICACY QUESTIONNAIRES AND BARTHEL INDEXES

<table>
<thead>
<tr>
<th>Patient Type and Number</th>
<th>Self-Efficacy Questionnaires</th>
<th>Barthel Indexes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Within Three Days</td>
<td>Two Weeks</td>
</tr>
<tr>
<td>Quadriplegics 1</td>
<td>73</td>
<td>63</td>
</tr>
<tr>
<td>Quadriplegics 4</td>
<td>94</td>
<td>71</td>
</tr>
<tr>
<td>Quadriplegics 7</td>
<td>92</td>
<td>29</td>
</tr>
<tr>
<td>Quadriplegics 11</td>
<td>84</td>
<td>53</td>
</tr>
<tr>
<td>Quadriplegics 13</td>
<td>79</td>
<td>33</td>
</tr>
<tr>
<td>Quadriplegics 14</td>
<td>47</td>
<td>40</td>
</tr>
<tr>
<td>X</td>
<td>78.2</td>
<td>48.2</td>
</tr>
<tr>
<td>SD</td>
<td>15.68</td>
<td>15.43</td>
</tr>
<tr>
<td>Paraplegics 2</td>
<td>80</td>
<td>80</td>
</tr>
<tr>
<td>Paraplegics 3</td>
<td>81</td>
<td>95</td>
</tr>
<tr>
<td>Paraplegics 5</td>
<td>105</td>
<td>79</td>
</tr>
<tr>
<td>Paraplegics 6</td>
<td>79</td>
<td>47</td>
</tr>
<tr>
<td>Paraplegics 8</td>
<td>50</td>
<td>45</td>
</tr>
<tr>
<td>Paraplegics 9</td>
<td>72</td>
<td>50</td>
</tr>
<tr>
<td>Paraplegics 10</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Paraplegics 12</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Paraplegics 15</td>
<td>78</td>
<td>80</td>
</tr>
<tr>
<td>X</td>
<td>83.9</td>
<td>76.2</td>
</tr>
<tr>
<td>SD</td>
<td>17.35</td>
<td>22.51</td>
</tr>
</tbody>
</table>

The difference between the means of the quadriplegics and the paraplegics on the third self-efficacy rating was 32.8 versus 74.0, and $t = 4.730$ (d.f. = 13), $p < .001$. The average for the quadriplegics fell 45.5 points between the first self-efficacy rating and the last self-efficacy rating. The drop for the paraplegics was only 9.9 points.
Therefore, it appears that the paraplegics were far more consistent in their self-efficacy expectations. The quadriplegics were as optimistic as the paraplegics at admission, but their expectations dropped dramatically as time went on. Referring back to Figure 3, only one quadriplegic was classified as low self-efficacy, high Barthel outcome. One paraplegic was classified as low self-efficacy, high outcome, and one was classified as high self-efficacy, low outcome. All low self-efficacy, low outcome subjects were quadriplegics, and all high self-efficacy, high outcome subjects were paraplegics.

These results do support the hypothesis that high self-efficacy subjects will have high outcomes, whereas low self-efficacy subjects will have low outcomes. However, the results also seem to indicate that, in spinal cord-injured persons, the level of injury may be a significant factor in determining self-efficacy expectations. Since the level of injury has a direct bearing on rehabilitation outcome, especially within the first six weeks, and since self-efficacy expectations are based upon perceived outcome, it only follows that those with lower perceived outcomes will have lower self-efficacy expectations.
CHAPTER BIBLIOGRAPHY


CHAPTER V

CONCLUSIONS AND DISCUSSION

Conclusions

Based on the results of this study, the following conclusions were drawn.

1. Upon admission, patients were unable to accurately predict their rehabilitation outcome six weeks later.

2. Subjects were able to accurately predict their rehabilitation level four weeks before the staff rated their rehabilitation level.

3. The subjects were able to make an even more accurate prediction of their performance two weeks prior to the staff's rating.

4. All of the high self-efficacy/high rehabilitation outcome subjects were paraplegics, whereas all of the low self-efficacy/low rehabilitation outcome subjects were quadriplegics.

5. When paraplegics were compared to quadriplegics, the paraplegics' initial level of self-efficacy was closer to their outcome than was the quadriplegics'.
Relationship of Findings to Bandura's Theory of Self-Efficacy

The overall purpose of this study was to determine whether Bandura's theory of self-efficacy is applicable to the rehabilitation of spinal cord injured persons. Bandura's (1) theory states that a person's assessment of his own abilities can predict his behavior in a given situation. This investigation was designed to determine how accurately spinal cord injured persons could predict their level of rehabilitation performance in advance. The results of the study indicate limited support for Bandura's theory.

The initial research on self-efficacy by Bandura, Adams, and Beyer (3) demonstrated that self-efficacy expectations were accurate predictors of behavior even in situations where the person had demonstrated no prior overt coping experience. The results of this present study do not support Bandura et al.'s previous findings in this regard. Upon admission, subjects were unable to accurately predict their rehabilitation outcome six weeks later. In fact, their expectations revealed that, among both paraplegics and quadriplegics, all subjects were highly optimistic about their rehabilitation outcome. The self-efficacy expectations of the subjects in this study were not accurate predictors of behavior in a situation where no prior coping experience existed. However, within two
weeks of admission, subjects were able to accurately predict their rehabilitation outcome. Their predictions became even more accurate within four weeks of admission. These last two findings do support Bandura's basic theory.

However, it is difficult to ascertain whether self-efficacy expectations were predictive of rehabilitation outcome behaviors or whether physical limitations were predictive of rehabilitation outcome behaviors and self-efficacy expectations changed to reflect those limitations in behavior. All of the low self-efficacy/low rehabilitation outcome patients were quadriplegics, and all of the high self-efficacy/high rehabilitation outcome patients were paraplegics. This finding seems to indicate some relationship between self-efficacy expectations and gross motor deficits. None of the previous research on self-efficacy expectations has examined the relationship between self-efficacy expectations and outcome behaviors where gross motor deficits have occurred. The study by Weinberg, Gould, and Jackson (5) analyzed the perceptions of motor performance in individuals with intact neuromuscular functioning. In this current study, a person's actual physical abilities were impaired. Yet, upon admission, the subjects did not seem to be aware of the severe limitations of their impairment. That could account for the high self-efficacy scores upon admission. Two weeks after admission,
self-efficacy scores were highly correlated with rehabilitation outcome scores. Obviously, something occurred within that two-week span which significantly changed the patients' self-efficacy expectations. Perhaps they realized the extent of the impairment they had suffered. Perhaps other changes occurred which changed their self-efficacy expectations.

Bandura (2, pp. 202-203) has theorized several causes for changes in self-efficacy expectations over time. He has theorized that self-efficacy information can be obtained from four sources: vicarious experience, performance accomplishments, verbal persuasion, and physiological arousal. He further theorizes that, as the person gains more information, his self-efficacy expectations fall more in line with his outcome behavior. Although the purpose of this study was not to identify the sources of self-efficacy information involved in spinal cord injury rehabilitation, the results do indicate a significant change in subjects' self-efficacy expectations over time. Upon admission, subjects seemed to be unable to predict their performance six weeks later. However, two weeks later, subjects were able to accurately predict their outcome performance. Obviously, the patients obtained some information which enhanced their self-efficacy expectations. They may have observed the performance of other spinal cord injured persons. They may
have observed their own progress, or lack thereof, during rehabilitation. Also, they may have received information from the rehabilitation staff which affected their self-efficacy expectations. It is interesting to note that paraplegics and quadriplegics had similar ratings of self-efficacy at admission. The quadriplegics obviously learned very early how overly optimistic those initial ratings were.

Bandura (1) theorizes that high self-efficacy subjects will have high outcomes, whereas low self-efficacy subjects will have low outcomes. The results of this study seem to support this part of his theory. The scores on both the second and third Self-Efficacy Questionnaires were significantly correlated with the scores on the final Barthel Index rating. The two-by-two tables presented also lend graphic support to Bandura's theory. The fact that all of the high self-efficacy/high rehabilitation outcome subjects were paraplegics and all of the low self-efficacy/low rehabilitation outcome subjects were quadriplegics seems to indicate the importance of feedback regarding the extent of neuromuscular impairment in determining self-efficacy expectations.

In summary, this study supports Bandura's theory of self-efficacy in regard to self-efficacy expectancies being predictive of behavioral outcomes. It supports his theory
that high self-efficacy subjects will have high outcomes whereas low self-efficacy subjects will have low outcomes. However, the results of this study may raise a question about whether self-efficacy expectations alone predict behavioral outcomes. The results of this study do not support the findings of Bandura et al. (3) regarding the accuracy of self-efficacy expectations in situations where no prior overt coping experience occurred. Obviously, no matter how high the self-efficacy expectations, certain behaviors are highly improbable in subjects with severe physical impairments. Until subjects had been involved in actual rehabilitation, they were unable to predict their behavioral outcomes.

Significance of the Results

The results of this study are significant in that they provide an initial description of the relationship between self-efficacy expectations and rehabilitation outcome in spinal cord injured persons. The results indicate that a strong positive relationship exists between expectations and outcome. This study examined the relationship between a cognitive variable, self-efficacy expectations, and a primarily physical variable, physical rehabilitation outcome. Most other studies involving self-efficacy expectations have examined the relationship between self-efficacy expectations and behaviors which have primarily cognitive
or emotional components (phobias, smoking cessation, poor math performance, etc.). The results of this study seem to indicate that those with less severe injuries and therefore higher outcome probabilities had the highest levels of self-efficacy as measured on the second and third Self-Efficacy Questionnaires. Those with greater physical abilities had higher expectations and higher outcomes.

Another significant aspect of this study is that it provides a way of identifying a patient's level of self-efficacy early in the rehabilitation process. Staff members could use this information in several ways. They might help a patient with high self-efficacy expectations but a poor prognosis to come to grips with the reality of his injury. This may help the patient to be less frustrated and impatient with therapy. A person with low self-efficacy expectations but a good prognosis might be helped to see his true potential. This may help the patient to work harder toward a realistic goal.

Limitations of the Study and Recommendations for Further Study

The size of the sample in this study was relatively small and heterogeneous. In this study only paraplegics had high self-efficacy high outcome scores, and only quadriplegics had low self-efficacy/low outcome scores. A larger sample of more homogeneous subjects might yield more
descriptive findings. For example, in a large group of quadriplegics with similar prognoses, one could assess the real impact of self-efficacy expectations. Some quadriplegics might have high expectancies and high outcomes relative to other quadriplegics. This study was not sensitive enough to identify differences in self-efficacy expectations among subjects with similar injuries.

Even though the patients' scores on the Barthel Index improved significantly between admission and six weeks after admission, the Barthel Index was not sensitive to small changes in behavior. For example, a quadriplegic who had to be fed received a score of 0. The same quadriplegic who, six weeks later, needed only slight assistance with a hand splint but could feed himself also received a score of 0. A scale could be constructed to take those small but significant changes into account. Another way to emphasize the improvement in patients' behavior between admission and outcome would be to measure outcome six months after admission. This lengthening would also have the advantage of giving quadriplegics more time to learn more rehabilitation behaviors. Six weeks is a very short time for the most severely injured person to learn more than a few simple behaviors.

This study, being limited to six weeks of in-hospital rehabilitation, did not consider the influence of
self-efficacy expectations on more complex, non-physical components of rehabilitation. Further studies could examine the relationship between self-efficacy expectations and sexual functioning, marital adjustment, job placement, community involvement, and other behaviors which are more indicative of living as an independent, fully functioning spinal cord injured individual. Then rehabilitation professionals would have a more complete picture of the influence of self-efficacy expectations on the rehabilitation of spinal cord injured persons.

This study did not attempt to identify those variables which affect changes in self-efficacy expectancies over time. Studies could be designed to determine which information was the most critical in changing expectancies. Some factors which could be studied are modeling, participant performance, and staff expectancies. A highly successful spinal cord injured individual could be used as a model for other spinal cord injured persons in order to assess the importance of modeling in enhancing self-efficacy expectations. A study could be designed to assess the ways in which staff expectancies or prognoses affect the spinal cord injured person's self-efficacy expectations. Trieschmann (4) cites several studies which indicate that the behavior of the rehabilitation staff influences the behavior of the spinal cord injured person. Whether staff
expectancies influence patients' expectancies is a matter for further study.

This study did not examine the relationship between self-efficacy expectations and the persistence of coping behavior. Weinberg et al. (5) demonstrated that high self-efficacy subjects persisted significantly longer than low self-efficacy subjects on the second trial of leg lifting after failing the first. Persistence after failure would seem important during spinal cord injury rehabilitation. Studies could be designed to measure the impact of self-efficacy expectations upon persistence during rehabilitation.

This study also did not attempt to measure the strength of a person's self-efficacy expectations. Bandura (1) had found strength of expectation to be an important component in measuring self-efficacy expectations. Possibly the high initial self-efficacy scores in this study were due to hope (weak expectation) rather than to conviction (strong expectation). A study could be designed to determine the impact of the strength of self-efficacy expectations on the prediction of rehabilitation behavior outcomes.
CHAPTER BIBLIOGRAPHY


APPENDIX A

BARTHEL INDEX
Patient's Name: ______________________________

Your Name: ________________________________

Position: MD RN LVN PT OT AIDE

Today's Date: ________________

Please indicate the patient's current level of functioning.

1. Able to drink from a cup:
   a. Without help.
   b. With help.
   c. Not at all.

2. Able to feed self:
   a. Without help.
   b. With help.
   c. Must be fed.

3. Able to dress upper body:
   a. Without help.
   b. With help.
   c. Must be dressed.

4. Able to dress lower body:
   a. Without help.
   b. With help.
   c. Must be dressed.

5. Able to put on braces, if applicable:
   a. Without help.
   b. With help.
   c. Not applicable.

6. Able to wash hands and face, comb hair, brush teeth, and shave, if applicable:
   a. Without help.
   b. With help.
   c. Must be done for him/her.
7. Able to bathe self in tub, shower, or with complete sponge bath:
   a. Without help.
   b. With help.
   c. Must be bathed.

8. Able to control bladder:
   a. Without help.
   b. With aid of a catheter and leg bag he/she maintains without help.
   c. Has occasional accidents or needs assistance with catheter and leg bag.
   d. Incontinent.

9. Able to control bowel movements:
   a. Without help.
   b. With the aid of enemas or suppositories he/she administers.
   c. With the aid of enemas or suppositories someone else must administer.
   d. Incontinent.

10. Able to transfer from wheelchair to bed and return:
    a. Without help.
    b. With minimal assistance.
    c. Can get to sitting position but needs help in transfer.
    d. Must be transferred.

11. Able to get on and off toilet:
    a. Without help.
    b. With help.
    c. Not at all.

12. Able to get in and out of tub or shower:
    a. Without help.
    b. With help.
    c. Not at all.

13. Able to walk 50 yards on the level:
    a. Without help.
    b. With the aid of braces and crutches he/she is able to put on.
    c. With help.
    d. Not at all.
14. Able to walk up/down a flight of stairs:
   a. Without help.
   b. With the aid of braces and crutches he/she is able to put on.
   c. With help.
   d. Not at all.

15. Able to propel wheelchair 50 yards:
   a. Without help.
   b. With help.
   c. Not at all.
APPENDIX B

SCORING FOR BARTHEL INDEX
<table>
<thead>
<tr>
<th>Behaviors</th>
<th>Without Help</th>
<th>With Help</th>
<th>Not at All</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Drinking from a cup</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. Eating</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Dressing upper body</td>
<td>5</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4. Dressing lower body</td>
<td>7</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5. Putting on braces</td>
<td>0</td>
<td>-2</td>
<td>0</td>
</tr>
<tr>
<td>6. Grooming</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>7. Bathing</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>8. Controlling urination*</td>
<td>10</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>9. Controlling bowel movements*</td>
<td>10</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>10. Transfer from bed to wheelchair and return</td>
<td>15</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>11. Getting on and off toilet</td>
<td>6</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>12. Getting in and out of tub or shower</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>13. Walking 50 yards on level*</td>
<td>15</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>14. Walking up/down one flight of stairs*</td>
<td>10</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>15. Propelling wheelchair</td>
<td>5</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*For items 8, 9, 13, and 14 responses "a" and "b" are coded "without help," response "c" is coded "with help," and response "d" is coded "not at all."

°For item 10, "with minimal assistance" is given a score of 10, and "can get to sitting position but needs help in transfer" is given a score of 5.
APPENDIX C

LETTER OF PERMISSION FROM SWISS AVENUE HOSPITAL
April 27, 1983

Mrs. Anne Belanus 
2914 Mill Trail 
Carrollton, Texas 75007 

Dear Mrs. Belanus:

Your proposed research project on "The Relationship of Expectancy of Rehabilitative Therapy and Prognosis for Eventual Functional Recovery" has been reviewed and the proposal discussed with both the medical director and our executive administrative officer. The proposal as well as the informed consent documentation has been found to be acceptable and we would be pleased to coordinate with you on this project. You will have permission to administer your questionnaires to our spinal cord patients, contingent upon their volunteering for your study, and collect other pertinent data in accordance with the rules of ethical human research formulated by the American Psychological Association.

We anticipate you starting this project in the late spring.

Sincerely, 

C. Alan Hopewell/ 

C. Alan Hopewell, PhD 
Director, Psychology Services
APPENDIX D

INSTITUTIONAL REVIEW BOARD FOR THE PROTECTION OF HUMAN SUBJECTS (NORTH TEXAS STATE UNIVERSITY)

EXPEDITED REVIEW FORM
THE INSTITUTIONAL REVIEW BOARD
FOR THE PROTECTION OF HUMAN SUBJECTS
NORTH TEXAS STATE UNIVERSITY

EXPEDITED REVIEW FORM

1. Activity Director  Dr. Bodenhamer and Anne Belanus

2. Activity Title  The Influence of Self-Efficacy Expectations on Rehabilitation Outcome in Spinal Cord Injured Individuals

3. Department  Rehabilitation

4. Phone  3462  5. Date Submitted  May 6, 1983

The statement submitted for this activity conforms to the Department of Health and Human Services and the Food and Drug Administration Final Regulations for the protection of human subjects under the category of Expedited Review under 45 CFR 46.110 and is approved.

Rollie Schafer, Chairman,
Institutional Review Board  

May 23, 83  Date
FORM 1

STATEMENT BY PRINCIPAL INVESTIGATOR OR ACTIVITY DIRECTOR

A. Activity Director: Eugenia Rodebush, Ph.D. and Anne Belanus, B.A.

B. Activity Title: The Influence of Self-Efficacy Expectations on Rehabilitation Outcome in Spinal Cord Injured Individuals (Masters Thesis)

C. Department: Rehabilitation

D. Phone & Ext. 3462

E. Date Submitted May 6, 1983

F. Respond to each of the following on separate pages.

1. Identify the requirements for the subject population. Explain the rationale if the population includes a special group such as prisoners, children, mentally disabled, or those whose ability to give informed consent may be in question.

2. Specifically identify those procedures in which a human subject is used which depart from the application of those established and accepted methods necessary to meet his needs, or which increase the ordinary risks of daily life, including the recognized risks inherent in a chosen occupation or field of service.

3. Describe and assess any potential risks -- physical, psychological, social, legal, etc.: and assess the likelihood and seriousness of such risks.

4. If electronic or stressful instrumentation is to be used, provide the name of the manufacturer, the model number and appropriate specifications of the device, as well as how it is to be used on the subjects.

5. Describe procedures, including confidentiality safeguards, for protecting against or minimizing potential risks and an assessment of the likely effectiveness of the procedures (i.e., physician's examination; required attending physician; attending registered technician, etc.).

6. Assess the potential benefits to be gained by the individual subject, as well as benefits which may accrue to society in general as a result of the planned work.

7. Analyze the risk/benefit ratio.
F. 1. Subjects shall be spinal cord injured individuals who have been admitted for comprehensive rehabilitation at Swiss Avenue Hospital, Dallas, Texas.

2. Subjects will be receiving rehabilitation services identical to patients who are not involved in this study. Each subject will be asked to complete three Self-efficacy Questionnaires (see attached) and one Background Information sheet (see attached). Staff members who work with the patient will complete a Barthel Index (see attached) at admission and six weeks after admission.

3. No potential risks to subjects are anticipated.

4. No instrumentation is to be used on subjects.

5. To protect confidentiality, each subject will be assigned a number on a master list. The Background Information sheet and all Self-efficacy Questionnaires will be identified only by number. The master list will be kept separate from the completed instruments. The Barthel Index ratings, which staff members will complete, will remain with the principal investigator. These ratings will be identified by name only, with no reference to the subject's code number. Additionally, no data identifying individual subjects will be used in reporting results of this investigation.

6. The subjects in this study stand to gain no benefit from this study. However, if the results indicate that self-efficacy expectations are significant predictors of rehabilitation outcome, programs can be designed to enhance the expectations of spinal cord injured persons and, thereby, enhance their rehabilitation outcome.

7. On a scale from one to ten, with one being the lowest or least amount, the risk to subjects involved in this study is judged to be one. The potential benefit to knowledge and rehabilitation practice is judged to be six. Therefore, the risk/benefit ratio is 1/6.
To assist the Committee further in its analysis of the direct or potential benefit of this activity against the potential risk to the individual, answer the following questions in the spaces provided.

1. What specific information will this activity provide, and what is the significance of that information? (Please answer in language that can be readily understood by persons in disciplines other than yours). This activity will provide information concerning how a person's belief in himself influences how well he performs in rehabilitation. Such information would be useful in identifying those who have poor belief so that steps could be taken to foster more positive attitudes.

2. Could this information be obtained from other animals or other laboratory models?

   YES  X  NO  Explain your response.

   This study can only be done using actual spinal cord injured persons involved in rehabilitation.

3. Are there alternative ways to acquire this information from human subjects that may avoid the risks identified in Item F, 2 & 3?  YES  X  NO

   If "YES" response, explain why the alternatives are not being used.

4. Is participation in the activity completely voluntary?  X  YES  NO

   If "NO" response, explain.

5. May any subject withdraw from the activity at any time without penalty?  X  YES  NO

   If "NO", explain.
6. Is any kind of incentive offered to the subject? If "YES" response, explain the type and amount. 

YES  X  NO

SIGNATURE of
Principal Investigator or Activity Director
Anne Belanus

SIGNATURE of
APPROVAL Department Chairman

Attach a copy of the Informed Consent Form 2 filled in as completely as you expect to present it to the subject for signature. Include a copy of your statement to the subject covering the six basic elements* required by an informed consent as identified below.

*Informed consent must include the following six basic elements:

1. A fair explanation of the procedures to be followed, and their purposes, including an identification of those which are experimental;

2. A description of any attendant discomforts and risks reasonably to be expected;

3. A description of any benefits reasonably to be expected;

4. A disclosure of any appropriate alternative procedures that might be advantageous for the subject;

5. An offer to answer any inquiries concerning the procedures; and

6. An instruction that the person is free to withdraw his consent and to discontinue participation in the project or activity at any time without prejudice to the subject.
FORM 2
USE OF HUMAN SUBJECTS
INFORMED CONSENT

NAME OF SUBJECT: _________________________________

1. I hereby give consent to A. Belanus or G. Bodenhamerto perform or supervise the following investigational procedure or treatment: To have me complete three questionnaires about which rehabilitation behaviors I believe I will be able to perform six weeks after I complete the initial questionnaire. I also agree to complete a Background Information sheet. I give my consent to the staff of Swiss Avenue Hospital to evaluate my rehabilitation behaviors upon admission and six weeks after admission.

DATE SIGNED: ____________________________

WITNESS: ____________________________

SIGNED: ____________________________

SUBJECT or PERSON RESPONSIBLE

WITNESS: ____________________________

SIGNED: ____________________________

WITNESS: ____________________________

SIGNED: ____________________________

Instructions to persons authorized to sign:

If the subject is not competent, the person responsible shall be the legal appointed guardian or legally authorized representative.
If the subject is a minor under 18 years of age, the person responsible is the mother or father or legally appointed guardian.
If the subject is unable to write his name, the following is legally acceptable: John H. (His X Mark) Doe and two (2) witnesses.
The Influence of Self-Efficacy Expectations on the Rehabilitation Outcome of Spinal Cord Injured Patients

Abstract

A spinal cord injury is among the most traumatic of disabilities, requiring extensive rehabilitation immediately following the injury. Many individuals leave the hospital to lead independent lives, yet many return to the hospital, having been unable to live independently. Many studies have tried to determine why some people succeed in rehabilitation while others fail. To date, no objective measures have been found to predict outcome before rehabilitation actually begins.

Albert Bandura has identified self-efficacy expectation as one variable which predicts behavioral outcome. He defines self-efficacy as being concerned with judgments of how well one can organize and carry out courses of action required to deal with unfamiliar and often stressful situations. His theory has been shown to predict outcomes on the treatment of phobics, smokers, children with math difficulties, and in the performance of athletic events. However, his theory has never been tested in relation to spinal cord injured rehabilitation.

The purpose of this study is to determine whether self-efficacy expectations predict rehabilitation outcome in spinal cord injured persons and to determine whether the rehabilitation process changes one's self-efficacy expectations. The procedure involves administering the Self-Efficacy Questionnaire (attached) to each subject within five (5) days of admission to the Physical Medicine & Rehabilitation Department and again in two weeks and in four weeks. Each person will also complete an Information Sheet to gain information regarding other possible independent variables. At the end of six weeks, a knowledgeable member of the rehabilitation team will assess the person's outcome via the Barthel Index (attached).

If significant results occur between self-efficacy expectations and rehabilitation outcomes, we are then in a position to design programs to enhance one's efficacy expectations.
APPENDIX E

SELF-EFFICACY QUESTIONNAIRE
Please circle the letter of the item as it applies to what you believe that you will be able to do at the end of weeks. There are no right or wrong answers. No one will read your answers except the tester. Please be as honest as you can.

1. I believe that I will be able to drink from a cup:
   a. Without help.
   b. With help from someone else.
   c. Not able to at all.

2. I believe that I will be able to feed myself:
   a. Without help.
   b. With help from someone else.
   c. Must be fed.

3. I believe that I will be able to dress my upper body:
   a. Without help.
   b. With help from someone else.
   c. Must be dressed.

4. I believe that I will be able to dress my lower body:
   a. Without help.
   b. With help from someone else.
   c. Must be dressed.

5. I believe that I will be able to put on any necessary braces:
   a. Without help.
   b. With help from someone else.
   c. Must have braces put on.

6. I believe that I will be able to wash my hands and face, comb my hair, brush my teeth, and shave, if applicable:
   a. Without help.
   b. With help from someone else.
   c. Must have someone do all these things for me.
7. I believe that I will be able to bathe myself either in a tub, shower, or by a complete sponge bath:
   a. Without help.
   b. With help from someone else.
   c. Must be bathed entirely by someone else.

8. I believe that I will be able to control my bladder:
   a. Without help.
   b. With the aid of a catheter and leg bag which I will take care of myself.
   c. With the aid of a catheter and leg bag which someone else will take care of.
   d. Will not be able to control my bladder at all.

9. I believe that I will be able to control my bowel movements:
   a. Without help.
   b. With the aid of suppositories or enemas I administer.
   c. With the aid of suppositories or enemas someone else administers.
   d. Will not be able to control my bowels at all.

10. I believe that I will be able to transfer from my bed to my wheelchair and return:
    a. Without help.
    b. With minimal help from someone else.
    c. With help on transfer but I can sit up myself.
    d. Only if someone else transfers me.

11. I believe that I will be able to get on and off the toilet:
    a. Without help.
    b. With help from someone else.
    c. Will not be able to at all.

12. I believe that I will be able to get in and out of tub or shower:
    a. Without help.
    b. With help from someone else.
    c. Not at all.
13. I believe that I will be able to walk 50 yards on the level:
   a. Without help.
   b. With the aid of braces and crutches I am able to put on.
   c. With the help of someone else.
   d. Not at all.

14. I believe that I will be able to walk up/down one flight of stairs:
   a. Without help.
   b. With the aid of braces and crutches I am able to put on.
   c. With the help of someone else.
   d. Not at all.

15. I believe that I will be able to propel my wheelchair 50 yards:
   a. Without help.
   b. With the help of someone else.
   c. Not at all.
APPENDIX F

BACKGROUND INFORMATION
Patient's Number __________ Hospital ____________________________

Today's date ____________________________

Day   Month   Year

Age _______ Sex: M F Race: N C LA O

Cause of injury ____________________________

Date of injury ____________________________

Day   Month   Year

Date of admission to rehabilitation facility ____________________________

Day   Month   Year

Cord level ____________________________

Complete/Incomplete (circle one)

_____ C_4_5      _____ T_1_0-L_2

_____ C_6-7      _____ L_1_3-5

_____ C_8-T_9      _____ Sacral

Other major medical problems ____________________________

____________________________________

Education completed

_____ less than 8 years     _____ some college

_____ 8-11 years     _____ college graduate

_____ high school graduate     _____ post graduate

Vocation prior to injury ____________________________

____________________________________

Marital status

_____ married     _____ divorced

_____ single     _____ widowed
APPENDIX G

SUBJECT CONSENT FOR PARTICIPATION IN RESEARCH:

SWISS AVENUE HOSPITAL, DALLAS
Title: The Influence of Self-Efficacy Expectations on Rehabilitation Outcome in Spinal Cord Injured Individuals

Investigators: Anne Belanus
Dr. Alan Hopewell
Dr. Genie Bodenhamer

You are invited to participate in a research study to see if what a person believes about how he or she will do in spinal cord injury rehabilitation influences how he or she actually performs. We hope to learn how one's beliefs influence one's rehabilitation outcome. You were selected as a possible participant in this study because you are a spinal cord injured person beginning your program of rehabilitation. Your participation in our study will last about six weeks.

If you decide to participate, you will be asked to answer 15 questions concerning what you think you will be able to do after being in rehabilitation for six weeks. You will be asked to fill out this questionnaire as soon as you agree and again in two weeks and four weeks. At the end of six weeks, a member of the rehabilitation team will be asked to rate how you have actually done in rehabilitation. Each questionnaire can be filled out in less than 15 minutes. Although this study involves no risk to you, some of the questions may be difficult for you to rate at first.
We cannot and do not guarantee or promise that you will receive any benefits from this study.

Your participation in this study will in no way affect the treatment you receive during rehabilitation.

You have the right to privacy, and all information that is obtained in connection with this study and that can be identified with you will remain confidential. No information gained from this study that can be identified with you will be released to anyone other than the investigators. The results of this study may be published in scientific journals without identifying you by name.

If you have any questions about the research or about your rights as a subject, we expect you to ask us. If you have questions later, Anne Belanus may be reached at 242-9489.

Participation in this research study is entirely voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without affecting your status as a patient or the medical care you will receive.

You will be given a copy of this document to keep.
YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE IN THIS STUDY. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ (OR BEEN READ) THE INFORMATION PROVIDED ABOVE.

Signature of Subject

Date

Time

Relationship to Subject
(sign only if patient is unable to sign)

Signature of Witness

Signature of Investigator
APPENDIX H

SUBJECT CONSENT FOR PARTICIPATION IN RESEARCH:

DALLAS REHABILITATION INSTITUTE
Title: The Influence of Self-Efficacy Expectations on Rehabilitation Outcome in Spinal Cord Injured Individuals

Investigators: Dr. George Wharton
Dr. C. E. McCoy

You are invited to participate in a research study to see if what a person believes about how he or she will do in spinal cord injury rehabilitation influences how he or she actually performs. We hope to learn how one's beliefs influence one's rehabilitation outcome. You were selected as a possible participant in this study because you are a spinal cord injured person beginning your program of rehabilitation. Your participation in our study will last about six weeks.

If you decide to participate, you will be asked to answer 15 questions concerning what you think you will be able to do after being in rehabilitation for six weeks. You will be asked to fill out this questionnaire as soon as you agree and again in two weeks and four weeks. At the end of six weeks, a member of the rehabilitation team will be asked to rate how you have actually done in rehabilitation. Each questionnaire can be filled out in less than 15 minutes. Although this study involves no risk to you, some of the questions may be difficult for you to rate at first.
We cannot and do not guarantee or promise that you will receive any benefits from this study.

Your participation in this study will in no way affect the treatment you receive during rehabilitation.

You have the right to privacy, and all information that is obtained in connection with this study and that can be identified with you will remain confidential. No information gained from this study that can be identified with you will be released to anyone other than the investigators. The results of this study may be published in scientific journals without identifying you by name.

If you have any questions about the research or about your rights as a subject, we expect you to ask us. If you have questions later, you may contact Dr. McCoy in Behavioral Medicine.

Participation in this research study is entirely voluntary. Refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without affecting your status as a patient or the medical care you will receive.

You will be given a copy of this document to keep.
YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE IN THIS STUDY. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ (OR BEEN READ) THE INFORMATION PROVIDED ABOVE.

Signature of Subject  Date _______________ Time _______________

Relationship to Subject
(sign only if patient is unable to sign)  Signature of Witness

Signature of Investigator
APPENDIX I

RESPONSES TO ITEMS ON THE SELF-EFFICACY QUESTIONNAIRE AND THE BARTHEL INDEX (DATA FOR 15 SUBJECTS)
<table>
<thead>
<tr>
<th>Behaviors</th>
<th>Number Rated Independent*</th>
<th>Number Rated with Assistance*</th>
<th>Number Rated Not at All*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>I</td>
<td>II</td>
<td>III</td>
</tr>
<tr>
<td></td>
<td>PT</td>
<td>AD</td>
<td>PT</td>
</tr>
<tr>
<td>Drinking</td>
<td>15</td>
<td>14</td>
<td>14</td>
</tr>
<tr>
<td>Feeding</td>
<td>15</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Dress upper body</td>
<td>12</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Dress lower body</td>
<td>12</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>Don braces</td>
<td>11</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Grooming</td>
<td>15</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Bathing</td>
<td>11</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Bladder control</td>
<td>13</td>
<td>10</td>
<td>7</td>
</tr>
<tr>
<td>Bowel control</td>
<td>13</td>
<td>10</td>
<td>5</td>
</tr>
<tr>
<td>Wheelchair transfers</td>
<td>8</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Toilet transfers</td>
<td>9</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Tub/shower transfers</td>
<td>7</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>Walk on level 50 yards</td>
<td>6</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Climb one flight of stairs</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Maneuver wheelchair</td>
<td>15</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

*Ratings: I—Self-Efficacy Questionnaire within three days of admission, II—Self-Efficacy Questionnaire after two weeks, III—Self-Efficacy Questionnaire after four weeks; B₁—Barthel Index rating at admission, B₂—Barthel Index rating six weeks after admission. Barthel Index ratings: PT—therapist (N = 15), AD—aide (B₁—N = 12, B₂—N = 11).

*Additional category: Can sit but not transfer; ratings: I—3, II—3, III—1; B₁: PT—1, AD—2; B₂: PT—1, AD—1.
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Unpublished Material

Kevorkian, George, M.D., personal communication, January 7, 1982.