The Effects of Animal Assisted Therapy When Used as an Adjunct to Occupational Therapy in the Rehabilitation of Persons Who Have Had Cerebral Vascular Accidents

Alice Arlene Briggs

Western Michigan University

Follow this and additional works at: https://scholarworks.wmich.edu/masters_theses

Part of the Occupational Therapy Commons

Recommended Citation
https://scholarworks.wmich.edu/masters_theses/4704

This Masters Thesis-Open Access is brought to you for free and open access by the Graduate College at ScholarWorks at WMU. It has been accepted for inclusion in Master's Theses by an authorized administrator of ScholarWorks at WMU. For more information, please contact maira.bundza@wmich.edu.
THE EFFECTS OF ANIMAL ASSISTED THERAPY WHEN USED AS AN ADJUNCT TO OCCUPATIONAL THERAPY IN THE REHABILITATION OF PERSONS WHO HAVE HAD CEREBRAL VASCULAR ACCIDENTS

by

Alice Arlene Briggs

A Thesis
Submitted to the Faculty of The Graduate College in partial fulfillment of the requirements for the Degree of Master of Science Department of Occupational Therapy

Western Michigan University
Kalamazoo, Michigan
December 1997
ACKNOWLEDGMENTS

I would like to thank my committee, Dr. JoAnne Wright, Barbara Hooper and Mary Ann Bush. Their guidance and input was invaluable for the completion of this project.

I would also like to thank Shari Bernard at Tyler Rehabilitation Hospital in Tyler, Texas for her assistance in this project. Her outstanding animal assisted therapy program and her assistance made this thesis possible.

To my family as well, I give my most sincere thanks for all their love and support. They have encouraged me to follow my dreams and to persist even when things became difficult.

Alice Arlene Briggs
The effects of animal assisted therapy when used as an adjunct to occupational therapy in the rehabilitation of persons who have had cerebral vascular accidents

Alice Arlene Briggs, M.S.
Western Michigan University, 1997

Occupational therapists can use animals to assist their clients in achieving goals in treatment. Most often dogs are used as they are more easily trained. The dog may fetch a ball thrown by the client or stand still and allow the client to brush it. These activities with the animal increase the client’s range of motion, endurance and strength. Dogs as well as other animals are used in various ways to elicit the desired response from the client. No studies were found in the literature that examined the use of animals as adjuncts to, or as modalities in occupational therapy in a manner that would allow statistical interpretation of the data.

This study used an ex post facto pretest/post-test design to determine the efficacy of animal assisted therapy to reach occupational therapy goals for persons who had experienced cerebral vascular accidents and were treated at a rehabilitation hospital. Animal assisted therapy was shown to be a statistically significant predictor of an increase in independence.
# TABLE OF CONTENTS

**ACKNOWLEDGMENTS** ................................................................. ii

**LIST OF TABLES** ........................................................................... iv

**CHAPTER**

I. INTRODUCTION ........................................................................... 1

II. REVIEW OF RELATED LITERATURE ........................................... 8

III. METHODS .................................................................................. 12
    
    Design .......................................................................................... 12

    Instruments .................................................................................. 12

    Subject Selection .......................................................................... 14

    Procedures .................................................................................. 15

IV. FINDINGS ................................................................................... 17

V. CONCLUSIONS ............................................................................ 26

**APPENDICES**

A. The Facility’s Altered FIM ............................................................ 31

B. Client Data Sheet ......................................................................... 33

C. Approval Letter From the Facility .............................................. 35

D. Approval Letter From the Human Subjects Institutional
   Review Board ............................................................................. 38

**BIBLIOGRAPHY** ............................................................................ 40
LIST OF TABLES

1. Animal Assisted Therapy in the Treatment of Subjects With Cerebral Vascular Accidents ................................................................. 19

2. Animal Assisted Therapy and Length of Stay in Predicting a Greater Increase in FIM Scores ...................................................................... 20

3. Animal Assisted Therapy in the Treatment of Subjects With Left Hemisphere Cerebral Vascular Accidents ................................................................. 21

4. Animal Assisted Therapy in the Treatment of Subjects With Right Hemisphere Cerebral Vascular Accidents ................................................................. 21

5. Animal Assisted Therapy in the Treatment of Male Subjects With Cerebral Vascular Accidents ........................................................................................ 24

6. Animal Assisted Therapy in the Treatment of Female Subjects With Cerebral Vascular Accidents ....................................................................................... 25
CHAPTER I

INTRODUCTION

The positive effects of interactions between humans and animals is the basis for animal assisted therapy. Human interactions with animals have many physiological and psychological benefits. However, few studies have examined the role of the animal when used as an adjunct to occupational therapy. Most studies published in the literature are anecdotal. Other studies lack statistically significant results due to small sample size and no control group.

This study was the first to statistically examine the effects of animal assisted therapy when used as an adjunct to occupational therapy. Therapists considering starting an animal assisted therapy program at their facility may find the results helpful. In particular, the results will apply to facilities who treat persons who have had cerebral vascular accidents.

The animal assisted therapy program used in this study is in place at a JCAHO/CARF accredited rehabilitation hospital with 63 beds. This facility has a rigorous screening and training program for the animals and volunteers. Animal assisted therapy occurs most often with dogs as their training assures high reliability in any given situation. The owner of the
animal also goes through an orientation describing the various types of clients he or she might come across while volunteering. The greatest benefit for the client is a result of the combined efforts of the dog, owner, and therapist during the treatment session (Bernard, 1995).

The director at this facility developed the program with great care considering the needs of both the clients as well as the dogs. The concentration and control required for treatment sessions is very tiring for the dog. Therefore, the dogs do not work more than three hours at a time, nor more than once a week. If the volunteers come at the same time and day each week, they can work with the same clients. The volunteer can then get to know the client and observe the client’s progress. The client also gets the benefit of the same volunteer and dog coming week after week, as this allows for the therapist to evaluate and work on the client’s memory. The director of the facility’s program does not require weekly visits. However, the owner and dog must volunteer at least four times per year to retain their certification as a therapy team (Bernard, 1995).

There are three steps involved in the qualification of the therapy dogs. These include obedience classes, veterinary screening, and temperament evaluation. Each volunteer and dog must complete an eight to ten week obedience class. The owner must accompany the dog to obedience classes; this provides for confidence in the owner as well as the ability to correct problems that may arise in the future. The dog must be
solid in its obedience regardless of distractions. The owner provides the name of the obedience program that they have completed. The director often calls the instructor of the obedience program for his or her opinion on the dog's level of obedience as well as the dog's temperament (Bernard, 1995).

The second step is ensuring the overall health of the animal. A veterinary screening is essential. The owner's veterinarian fills out the health form. It has space for information regarding vaccinations given, overall health of the dog, and the dog's behavior during the examination. The dog receives the bordetella vaccination as several dogs frequently work together. The veterinarian returns the form directly to the facility to ensure that he or she feels free to be completely honest. If there are any questions regarding information provided by the veterinarian, the director calls him or her and asks those questions. The veterinarian must return both the health form and the current rabies certificate to the facility before the temperament training begins (Bernard, 1995).

Temperament testing occurs at the facility as this is a strange and potentially stressful environment for the dog. Any animal reacts in a manner most true to its temperament when placed in a stressful situation, regardless of obedience training. The owner does not know the specific items of the test before the evaluation so they are unable to modify the dog's behavior on problematic items. Such modification destroys the
validity of the test. The test includes five sections: obedience review, grooming, reaction to sound, tolerance, and reaction to sight. Each dog must be retested every two years. In addition, if the director feels that the dog’s behavior has changed due to increasing age, accident, or illness, he or she may request a retest at any time (Bernard, 1995).

Once the dog and owner have successfully completed all three steps of the screening and evaluation process, they enroll in a series of training sessions. There, the owners and dogs train in the specific commands and equipment used at the hospital. The director exposes the volunteer and therapy dog to situations that frequently occur during the treatment of clients. This orients the dog and allows the owner to have a better understanding of the experiences of the clients (Bernard, 1995).

Once the owner and dog have completed all of these requirements, they receive picture identification badges as well as a special collar and leash. This uniform lets everyone at the facility know that the dog is a therapy dog and therefore may enter the facility. This is also helpful in eliminating other animals outside the program being smuggled into the facility. The director orients everyone from the administrators to housekeeping to the program so they can alert security if a non-therapy dog is present at the facility. The director gives them a complete explanation so they know the dog’s purpose and the benefits of the
program (Bernard, 1995). If a visitor questions them why a dog is in the facility, they can answer intelligently.

Petting and grooming, retrieving, and tug-of-war are the three main types of activities that a therapist can do with the therapy dogs. The therapist must consider each activity carefully so that he or she achieves maximum benefit for the client without decreasing the safety of both the client and the dog.

The positioning of the dog for petting and grooming is important and highly dependent on the client's individual goals. For example, if the client has left neglect, the therapist or volunteer places the dog's head towards the client's left to encourage attention toward that side. Regardless of the positioning of the dog, the owner always positions themselves at the dog's head so they have complete control over the dog.

The dog retrieves in an isolated, carpeted hallway. The isolation is important to protect other clients and staff from the ball or the running dog. The carpet is important for the safety of the dog. A dog could slip and hurt themselves on a slick surface (Bernard, 1995). Not only is this a risk for the dog, but a dog in pain will lash out, regardless of their training or temperament. The dog may then hurt the owner, staff, or clients. Again, control for the dog is very important, because it must wait patiently for the client to throw the ball. The dog must also return the ball promptly to the owner who then wipes the ball with a towel before giving it back to the
client. This prevents the dog from jumping up on the client. Tug-of-war is difficult to do safely and effectively and so the director at this facility rarely uses it (Bernard, 1995).

Dogs are able to augment treatment in many ways. For example, if a client’s goal is increasing upper extremity strength and endurance, the therapist may choose to have the client brush the dog. Depending on the existing strength and endurance of the client, the dog may lie down or stand, on a table or on the floor. The client may sit or stand, and may use wrist weights to increase resistance. The length and thickness of the coat of the dog are a consideration as the longer and thicker the coat, the greater the resistance. The type of brush used also determines the degree of resistance (Bernard, 1995).

The client who has cognitive or perceptual difficulties can be asked a series of yes or no questions. If they are unable to speak, they could point to the words placed on a card. The therapist may ask the client to describe the dog they worked with last time and compare that description with the dog they are working with this time (Bernard, 1995).

The director gives the volunteer an orientation manual that describes the dress code for the hospital, both for the volunteer and the animal. The volunteer bathes the dog within 24 hours of the intended visit and rinses it with an allergen reducing product. The volunteer must keep the dog’s nails short and filed so they are smooth. As part of the
dog’s hygiene, a veterinarian should check the dog’s teeth regularly for tartar build up and provide cleaning once a year after the age of three years. This helps to eliminate odor (Bernard, 1995).

The volunteer’s orientation manual also includes information on health precautions, insurance, parking, rewards for service, solicitation, photographs and video, tax deductions, timeliness, and what to bring with them for therapy. Animals who are in heat or have open wounds may not come into the facility. Each facility’s coordinator has designated potty areas outside where the owner can take their dog. The owner must pick up after their dog and dispose of it in an outside trash can. There are also rules and hints for dealing with the various client groups that they may meet during their visit (Bernard, 1995).

Although these precautions may seem excessive, they have allowed the director of this facility’s animal assisted therapy program to operate her program for fifteen years without an incident. There have been no injuries to animal or client. Also, there has been no damage to the facility itself due to the animal’s presence. The director has achieved this safe success through the meticulous planning and follow-through of the program as well as stringent screening of both animal and volunteer.
CHAPTER II

REVIEW OF RELATED LITERATURE

Animal assisted therapy is also known as pet facilitated therapy, animal facilitated therapy or pet therapy. There are many definitions of animal assisted therapy or pet facilitated therapy in the literature. Manor (1987) defines pet facilitated therapy as bringing animals into contact with people for therapeutic purposes such as companion animals, resident pets or visiting animals. Pet facilitated therapy is also the use of pets to assist a person with a disability. It is also used to help establish a therapeutic relationship between the client and therapist (Walsh, Mertin, Verlander & Pollard, 1995). Animal assisted therapy is defined as “the utilization of animals as part of a structured form of goal-directed therapy and not just the random interaction with animals which may be therapeutic” (Behling, 1990, p. 81). The animals assist the client and therapist in meeting the goals of therapy, such as increasing strength, endurance, sequencing, memory, standing balance and trunk rotation or decreasing left neglect (Collins, 1996). For example, the client may increase range of motion, strength, and endurance by brushing a dog that is lying on a table at shoulder height. The therapist positioning the client with the dog at their side, causes the client to work on trunk rotation as well. To assist in
memory, the therapist may ask the client to point to various parts of the dog. The client may also share stories about pets he or she had or the pets of people he or she knows.

Animals have beneficial physical effects on persons who interact with them ("Pet Power", 1994). Many document that interacting with an animal by watching or petting it lowers blood pressure (Hahn, 1981; Harris, Rinehart and Gerstman, 1993; Mack, 1994; Page, 1984; "Pet Power", 1994; Schellenberg, 1993), heart rate (Harris, Rinehart and Gerstman, 1993; Schellenberg, 1993), anxiety levels (Schellenberg, 1993), triglyceride levels (Schellenberg, 1993), and cholesterol ("Pet Power", 1994). Interacting with an animal can also decrease mental distress. Pet owners make fewer visits to the doctor than persons who do not own pets (Schellenberg, 1993).

Besides having beneficial psychological effects, animals are useful for reality orientation, stress reduction, improved social interactions and communications, improvement of self-esteem, and motivation for activities (Barba, 1995; Fick, 1993; Kalfon, 1991; Parlin, 1992). Dogs and cats provide people with love, affection, and companionship ("Pet Therapy," 1986). Dogs offer unconditional acceptance (Jessee, 1982; Mack, 1994; Sneider, 1992). Sneider (1992) states that animals do not judge people for past actions, or how they look resulting from the abuse of drugs or alcohol. Jessee (1982) finds that "pets do not reject someone who is an amputee,
nor do they look away because a person is old and in a wheelchair, and they do not avoid the person who cannot speak clearly” (p. 27).

Smith (1995) finds that some third-party payers recognize the value of animal assisted therapies, but many do not. Perhaps a clear definition of animal assisted therapy with directives as to its use, as well as additional research would increase the amount of third-party payer knowledge of animal assisted therapy.

The settings and uses of these programs are as varied as their definitions. Katz and Westbrook (1985) found animals used as companions in psychiatric facilities, nursing homes, hospitals, schools, and prisons. Animals are useful in treating loneliness, depression, inactivity, and stress (“Pet Therapy”, 1986). Animals also have helped with the following:

family and marital problems, isolation, loss of a loved one, phobias, chemical dependency, and eating disorders. Physical conditions that call for pet interaction prescriptions [include] blindness, deafness, physical handicaps, high blood pressure, recuperation from major surgery, terminal disease, diseases of old age, and mental retardation (“Pet Therapy”, 1986, p. 7).

A few therapists use animal assisted therapy as a modality. These animals assist with such things as activities of daily living skills, strength, endurance, standing balance, trunk rotation, left neglect, sequencing, and memory (Collins, 1996). “Animal assisted therapy is not proposed as a substitute for other forms of therapy but as a creative way to reach
therapeutic goals that may be more difficult to achieve without this
intervention" (Behling, 1990, p. 84).

Animal assisted therapy has many supporters. However, there has
been little research to validate this high level of support. Published
articles are mostly descriptions (Manor, 1987; Martin, 1993; Newberry, 1985;
Polon, 1984; Robinson, 1986; Westbrook & Katz, 1985), descriptive case
studies (e.g., Bailey, 1988; Haggard, 1985; Hibell, 1987; Twiname, 1984), and
case reports (Twiname, 1985). Those studies that employed a formal
research design rarely used a control group (e.g., Cole & Gawlinski, 1995;
McQuillen, 1985). The above suggests a need for research that would use a
formal research design with a control group. The number of subjects
should be large enough to allow for statistical interpretation of the data
(Beck, 1985; Beck & Katcher, 1984). This study is an attempt to do just that.
CHAPTER III

METHODS

Design

The question that this study sought to answer was: Is there a difference in the change of independence level after treatment between those who had animal assisted therapy and those who did not? This study used an ex post facto pretest/post-test design. The independent variable was the presence or absence of animal assisted therapy in the treatment of occupational therapy goals. The dependent variables are the length of stay, the change in level of independence, and the subjects' destination upon discharge. The change in level of independence of each individual was determined by a comparison of the pre-therapy and the post-therapy level of independence. Scores on the Functional Independence Measure show the level of independence of the subjects.

Instruments

The Functional Independence Measure (FIM) identifies the level and type of assistance necessary for specific tasks (Hill, 1993). It is a multidisciplinary assessment generally completed shortly after admission and just before discharge from an inpatient program. It includes self care,
mobility, cognitive function, and psychosocial function that together indicate the person’s level of independence (Schlageter & Zoltan, 1996). The FIM was developed at “the Center for Functional Assessment at the State University of New York at Buffalo under the direction of Carl V. Granger, M.D.” (Asher, 1996, p. 30).

The Functional Independence Measure has interrator reliability established using clinicians at 89 facilities with 1018 patients. The intraclass correlation coefficients were: 0.96 for the total FIM, 0.96 for the motor component, and 0.91 for the cognitive component. The subscale score was 0.98 - 0.94 (Asher, 1996). The Uniform Data System for Medical Rehabilitation (UDSMR) collects FIM scores in a national database. For a facility’s data to be included, the UDSMR requires certification of all professionals in charge of testing clients. The clinician must achieve a reliability rating of at least 0.80 to qualify for certification. Because this facility has its data in this database, the FIM scores taken there have reliability of at least 0.80. The FIM is valid in predicting the burden of care in minutes of physical assistance needed per day and the level of the subject’s satisfaction with life (Asher, 1996).

UB Foundation Activities, Inc produces the Functional Independence Measure (“Uniform Data”, 1993). The therapists at this facility used version 4.0 to assess the subjects. The facility altered the FIM in a few areas: (a) they separated locomotion into walking and wheelchair;
(b) comprehension into auditory and visual categories; (c) expression into verbal and non-verbal expression; and (d) eliminated safety judgment

There was a total of 21 items on the altered FIM scale.

Subject Selection

The subjects were adults, 50 years and older. They had one cerebral vascular accident as their primary diagnosis and had completed an occupational therapy program that included a pre and post therapy FIM assessment. The average FIM score must have been 4.0 per item or lower. Most subject’s scores averaged 3.0 per item and lower. The score of 4.0 per item was chosen so that there would be room for improvement for all subjects.

The subjects were selected from a list generated by the facility’s occupational therapist. The list consisted of all patients admitted to the rehabilitation hospital during 1996. All subjects from the list meeting the study’s criteria were selected.

The experimental group consisted of all subjects meeting the study’s criteria who had animal assisted therapy. Primarily, the occupational therapist refers clients at the facility to the animal assisted therapy program, although other professionals may also refer. Any client may be referred whose goals may be reached with this modality. A client is not considered if they are allergic to dogs, if they are afraid of dogs, if they
demonstrate agitation or are physically abusive. Clients are also not considered if they have open wounds or if they have an infectious condition that could be easily transmitted to the volunteer (Bernard, 1995). Not all referred clients are able to take part in the animal assisted therapy program due to the program's relatively small size. Clients who do take part in the animal assisted therapy program see the animals an average of five times per week, once each day for one half hour each time.

The members of the control group were selected by purposeful sampling to match the experimental group as closely as possible in number, age, sex, hemisphere of the brain involved in the cerebral vascular accident, initial FIM scores and length of time before beginning therapy. They were gathered from within the same facility but consisted of those who had not received animal assisted therapy as a part of their treatment. This controlled for geographical differences, socio-economical differences, and racial distribution.

Procedures

For each subject included in the study, a data sheet was completed which included date of birth, age, sex, diagnosis, and the hemisphere of the brain affected. Also recorded was the length of time between the onset of CVA and the beginning of treatment, the date of the CVA, the date treatment began, and the length of time in treatment. Data on the
duration of stay at the rehabilitation hospital for each subject, and the FIM scores, both initial and discharge, and their dates were also collected. The FIM scores were reported as motor and cognitive components as well as the total score. The subject’s date of and destination after discharge was also recorded.

Each subject in the experimental group was matched with a corresponding subject in the control group. They were matched by sex, hemisphere affected, age, length of time before beginning treatment, and initial FIM scores. Statistical analysis was performed to determine if there were any significant differences between the groups in the matched areas before treatment. Statistical analysis was performed again to determine if there was a significant difference between the groups regarding the length of stay and increase in FIM scores after treatment. The data were also analyzed to determine if animal assisted therapy or length of stay was the greater predictor of an increase in FIM scores.

The subject pool was initially analyzed as a whole, and then separated into subsets. Data on all of those who had left hemisphere CVAs were analyzed. Data on all of those who had right hemisphere CVAs were also analyzed. All data on males were analyzed, as well as all data on females. In each case, the data were analyzed to determine if the increase in FIM scores and length of stay was the same or different between the control and experimental groups.
CHAPTER IV

FINDINGS

The data in this study were taken from records of persons who had cerebral vascular accidents and were treated at a rehabilitation hospital. One of the treatment options at this hospital is animal assisted therapy, which works as an adjunct to other forms of therapy. The experimental group consists of those who had animal assisted therapy as a part of their treatment. The control group was matched to the experimental group in age, length of time post CVA before beginning treatment, and initial FIM scores. However, the control group did not have animal assisted therapy. This matching resulted in pairs of data that were then used in data analysis. The independent variable for data analysis is animal assisted therapy. The dependent variables are motor, cognitive, and total FIM scores; and length of stay.

The data were analyzed using a matched-pair $t$-test. This $t$-test uses the difference between the pairs to calculate the likelihood of change happening due to chance or experimental intervention. In this case, the difference was determined by subtracting the value of the variable of the person who had animal assisted therapy from the value of the variable of the individual who did not have animal assisted therapy. Therefore, a
positive number would indicate that the value of the variable for the control group was greater than that of the experimental group. Conversely, a negative number would indicate that the value of the variable for the experimental group was greater than that of the control group.

The first analysis included all subjects (Table 1). There were no significant differences between the experimental group (those receiving animal assisted therapy) and control group regarding age, the length of time between the onset of the CVA and beginning treatment, motor FIM scores, cognitive FIM scores, and total FIM scores (matched-pair $t$-test, $p < .001$).

The experimental group had a greater increase in motor, cognitive and total FIM scores than the control group. The length of stay was longer for the experimental group than the control group as well. A linear regression was performed to determine if animal assisted therapy or length of stay was a greater predictor of an increase in FIM scores (Table 2). A linear regression places the data into an equation for a line. The equation states that an increase in FIM scores is a result of some number added to a coefficient multiplied by length of stay added to another coefficient multiplied by animal assisted therapy. This equation shows which variable (animal assisted therapy or length of stay) is the greater
Table 1
Animal Assisted Therapy in the Treatment of Subjects With Cerebral Vascular Accidents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in Age</td>
<td>2.12</td>
<td>7.28</td>
<td>1.70</td>
<td>.0991</td>
</tr>
<tr>
<td>Difference in Days Post CVA</td>
<td>-35.97</td>
<td>149.64</td>
<td>-1.40</td>
<td>.1704</td>
</tr>
<tr>
<td>Difference in Initial Motor FIM</td>
<td>1.59</td>
<td>7.09</td>
<td>1.30</td>
<td>.2007</td>
</tr>
<tr>
<td>Difference in Initial Cognitive FIM</td>
<td>-0.65</td>
<td>6.18</td>
<td>-0.61</td>
<td>.5456</td>
</tr>
<tr>
<td>Difference in Initial Total FIM</td>
<td>0.91</td>
<td>6.01</td>
<td>0.88</td>
<td>.3829</td>
</tr>
<tr>
<td>Difference in Final Motor FIM</td>
<td>-13.00</td>
<td>20.92</td>
<td>-3.62</td>
<td>.0010*</td>
</tr>
<tr>
<td>Difference in Final Cognitive FIM</td>
<td>-4.09</td>
<td>7.45</td>
<td>-3.20</td>
<td>.0030*</td>
</tr>
<tr>
<td>Difference in Final Total FIM</td>
<td>-17.00</td>
<td>26.16</td>
<td>-3.79</td>
<td>.0006*</td>
</tr>
<tr>
<td>Difference in Length of Stay</td>
<td>-14.09</td>
<td>22.65</td>
<td>-3.63</td>
<td>.0010*</td>
</tr>
</tbody>
</table>

*Significance at the .05 level

predictor of the outcome (increase in FIM scores). This analysis allows for a statement to be made that states that length of stay was not a predictor of an increase in FIM scores. The presence of animal assisted therapy was a predictor of an increase in FIM scores (linear regression, p <.01).
Table 2
Animal Assisted Therapy and Length of Stay in Predicting a Greater Increase in FIM Scores

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>p -value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total FIM Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Assisted Therapy</td>
<td>16.714</td>
<td>.0002*</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>0.0202</td>
<td>.8650</td>
</tr>
<tr>
<td>Motor Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Assisted Therapy</td>
<td>12.750</td>
<td>.0004*</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>0.018</td>
<td>.8562</td>
</tr>
<tr>
<td>Cognitive Scores</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Animal Assisted Therapy</td>
<td>4.062</td>
<td>.0021*</td>
</tr>
<tr>
<td>Length of Stay</td>
<td>0.002</td>
<td>.9595</td>
</tr>
</tbody>
</table>

Note. N = 68. Linear regression. *Significance at the .05 level.

Two subsets of the subject pool were analyzed (Tables 3 and 4).

These two subsets were determined by the cerebral hemisphere affected by
the CVA. This was done to examine the effect of animal assisted therapy dependent upon the hemisphere of involvement.

Subjects with left hemisphere involvement were statistically

Table 3
Animal Assisted Therapy in the Treatment of Subjects With Left Hemisphere Cerebral Vascular Accidents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in Age</td>
<td>3.00</td>
<td>9.94</td>
<td>1.28</td>
<td>.2174</td>
</tr>
<tr>
<td>Difference in Days Post CVA</td>
<td>-40.50</td>
<td>170.27</td>
<td>-1.01</td>
<td>.3271</td>
</tr>
<tr>
<td>Difference in Initial Motor FIM</td>
<td>0.78</td>
<td>6.10</td>
<td>0.54</td>
<td>.5957</td>
</tr>
<tr>
<td>Difference in Initial Cognitive FIM</td>
<td>-0.55</td>
<td>6.15</td>
<td>-0.38</td>
<td>.7066</td>
</tr>
<tr>
<td>Difference in Initial Total FIM</td>
<td>0.22</td>
<td>6.88</td>
<td>0.14</td>
<td>.8926</td>
</tr>
<tr>
<td>Difference in Final Motor FIM</td>
<td>-19.67</td>
<td>22.38</td>
<td>-3.73</td>
<td>.0017*</td>
</tr>
<tr>
<td>Difference in Final Cognitive FIM</td>
<td>-7.22</td>
<td>6.21</td>
<td>-4.94</td>
<td>.0001*</td>
</tr>
<tr>
<td>Difference in Final Total FIM</td>
<td>-26.78</td>
<td>27.14</td>
<td>-4.19</td>
<td>.0006*</td>
</tr>
<tr>
<td>Difference in Length of Stay</td>
<td>-13.83</td>
<td>24.33</td>
<td>-2.41</td>
<td>.0274*</td>
</tr>
</tbody>
</table>

*Significance at the .05 level
Table 4

Animal Assisted Therapy in the Treatment of Subjects With Right Hemisphere Cerebral Vascular Accidents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in Age</td>
<td>1.12</td>
<td>1.63</td>
<td>2.76</td>
<td>.0145*</td>
</tr>
<tr>
<td>Difference in Days Post CVA</td>
<td>-30.88</td>
<td>127.89</td>
<td>-0.97</td>
<td>.3495</td>
</tr>
<tr>
<td>Difference in Initial Motor FIM</td>
<td>2.50</td>
<td>8.17</td>
<td>1.22</td>
<td>.2400</td>
</tr>
<tr>
<td>Difference in Initial Cognitive FIM</td>
<td>-0.75</td>
<td>6.40</td>
<td>-0.47</td>
<td>.6461</td>
</tr>
<tr>
<td>Difference in Initial Total FIM</td>
<td>1.69</td>
<td>4.96</td>
<td>1.36</td>
<td>.1939</td>
</tr>
<tr>
<td>Difference in Final Motor FIM</td>
<td>-5.50</td>
<td>16.79</td>
<td>-1.31</td>
<td>.2098</td>
</tr>
<tr>
<td>Difference in Final Cognitive FIM</td>
<td>-0.56</td>
<td>7.31</td>
<td>-0.31</td>
<td>.7625</td>
</tr>
<tr>
<td>Difference in Final Total FIM</td>
<td>-6.00</td>
<td>20.66</td>
<td>-1.16</td>
<td>.2636</td>
</tr>
<tr>
<td>Difference in Length of Stay</td>
<td>-14.38</td>
<td>21.41</td>
<td>-2.69</td>
<td>.0169*</td>
</tr>
</tbody>
</table>

*Significance at the .05 level

similar before treatment in all areas studied (Table 3). After treatment, there was a greater increase in FIM scores: motor, cognitive, and total. Length of stay was also longer for those who had animal assisted therapy.

Subjects with right hemisphere cerebral vascular accidents were statistically similar in all respects except for age, before beginning treatment. The control group was significantly older than was the
experimental group. There were no statistical differences in final FIM scores. The only statistically significant difference was the length of stay, which was longer for those with animal assisted therapy.

The subjects were divided into subsets regarding sex. Table 5 shows the results of the subset that include all males. Table 6 shows the results of the subset that include all females.

The male experimental and control groups were similar in age, days post CVA, and FIM scores before treatment (matched-pair \( t \)-test, \( p < .05 \)). After treatment, those in the experimental group had a larger increase in motor and total FIM scores than the control group. Length of stay was also longer for the experimental group than the control group. There was no difference in cognitive FIM scores.

The female subsets of the experimental and control groups were also similar in age, days post CVA, and FIM scores before treatment began (matched-pair \( t \)-test, \( p < .05 \)). After treatment, the experimental group had a greater increase in total, cognitive, and motor FIM scores. Length of stay was also longer for those who had animal assisted therapy than the control group.

The subject's destination after discharge was also examined. However, it was not possible to analyze the data further than simply noting the number of subjects that went to each possible destination. The
Table 5
Animal Assisted Therapy in the Treatment of Male Subjects With Cerebral Vascular Accidents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in Age</td>
<td>5.00</td>
<td>9.66</td>
<td>1.79</td>
<td>.1004</td>
</tr>
<tr>
<td>Difference in Days Post CVA</td>
<td>-70.00</td>
<td>206.51</td>
<td>-1.17</td>
<td>.2651</td>
</tr>
<tr>
<td>Difference in Initial Motor FIM</td>
<td>0.50</td>
<td>6.46</td>
<td>0.27</td>
<td>.7936</td>
</tr>
<tr>
<td>Difference in Initial Cognitive FIM</td>
<td>-1.25</td>
<td>7.05</td>
<td>-0.61</td>
<td>.5514</td>
</tr>
<tr>
<td>Difference in Initial Total FIM</td>
<td>-0.75</td>
<td>6.81</td>
<td>-0.38</td>
<td>.7101</td>
</tr>
<tr>
<td>Difference in Final Motor FIM</td>
<td>-15.42</td>
<td>20.50</td>
<td>-2.60</td>
<td>.0244*</td>
</tr>
<tr>
<td>Difference in Final Cognitive FIM</td>
<td>-4.00</td>
<td>10.68</td>
<td>-1.30</td>
<td>.2213</td>
</tr>
<tr>
<td>Difference in Final Total FIM</td>
<td>-19.25</td>
<td>29.20</td>
<td>-2.28</td>
<td>.0433*</td>
</tr>
<tr>
<td>Difference in Length of Stay</td>
<td>-17.50</td>
<td>26.48</td>
<td>-2.29</td>
<td>.0428*</td>
</tr>
</tbody>
</table>

*Significance at the .05 level

Four destinations of all subjects were home, a nursing home, transitional care unit, or hospital. Of the 34 subjects in the control group (without animal assisted therapy): 20 went home, 7 went to a nursing home, 3 were
Table 6
Animal Assisted Therapy in the Treatment of Female Subjects With Cerebral Vascular Accidents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>t-value</th>
<th>2-tail prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in Age</td>
<td>0.54</td>
<td>5.20</td>
<td>0.49</td>
<td>.6277</td>
</tr>
<tr>
<td>Difference in Days Post CVA</td>
<td>-17.41</td>
<td>108.76</td>
<td>-0.75</td>
<td>.4611</td>
</tr>
<tr>
<td>Difference in Initial Motor FIM</td>
<td>2.18</td>
<td>7.49</td>
<td>1.36</td>
<td>.1865</td>
</tr>
<tr>
<td>Difference in Initial Cognitive FIM</td>
<td>-0.32</td>
<td>5.80</td>
<td>-0.26</td>
<td>.7995</td>
</tr>
<tr>
<td>Difference in Initial Total FIM</td>
<td>1.82</td>
<td>5.48</td>
<td>1.56</td>
<td>.1348</td>
</tr>
<tr>
<td>Difference in Final Motor FIM</td>
<td>-11.68</td>
<td>21.51</td>
<td>-2.55</td>
<td>.0187*</td>
</tr>
<tr>
<td>Difference in Final Cognitive FIM</td>
<td>-4.14</td>
<td>5.24</td>
<td>-3.70</td>
<td>.0013*</td>
</tr>
<tr>
<td>Difference in Final Total FIM</td>
<td>-15.77</td>
<td>24.98</td>
<td>-2.96</td>
<td>.0075*</td>
</tr>
<tr>
<td>Difference in Length of Stay</td>
<td>-12.23</td>
<td>20.71</td>
<td>-2.77</td>
<td>.0115*</td>
</tr>
</tbody>
</table>

Note: n = 22. d = variable for control - variable for experimental. Matched-pair t-test.
*Significance at the .05 level

admitted to a transitional care unit, and 4 were admitted to another hospital. Of the 34 subjects in the experimental group: 24 went home, 8 went to a nursing home, 1 was admitted to a transitional care unit, and 1 was admitted to another hospital.
This study provides information regarding the use of animal assisted therapy to reach occupational therapy rehabilitation goals. In particular, its use with persons who had cerebral vascular accidents and were treated at a rehabilitation hospital. The number of subjects (68) allowed for statistical analysis. The pairing of the data allowed for statistical analysis using the matched-pair $t$-test.

This study has shown that there is a statistically significant increase in FIM scores for the group that had animal assisted therapy as a part of their occupational therapy treatment versus those who did not. Although those with animal assisted therapy stayed longer than the control group, it was shown that animal assisted therapy was a good predictor of the greater increase in FIM scores while the length of stay was not. Therefore, it can be concluded that the use of animal assisted therapy as an adjunct to the treatment of persons with cerebral vascular accidents leads to a greater independence for them.

The differences in the success of animal assisted therapy between subsets determined by hemisphere of the brain involved suggest an interesting question for future research. Was the difference in age
between the experimental and control groups before beginning treatment the determining factor that resulted in the lack of statistically significant differences after treatment? More research could help to determine if there are different uses for the animals that may better benefit the person with a right hemisphere cerebral vascular accident. The differences between the sexes also warrant further study. For example: Why was there no significant difference in the cognitive component of the FIM alone for males, while females showed a significant difference in all areas?

The destination of subjects also deserves further study. Although the numbers show a possible trend towards more subjects going home, there was no way to tell if this was significant. Additional studies with larger subject pools would be beneficial to determine if the greater independence of persons who have had animal assisted therapy translates into or correlates with a more independent living situation.

This study is only a predictor of how animal assisted therapy may be used effectively in the wide variety of treatment settings. The results can only be generalized to programs similar to the one at this facility. There, the animals are used as an adjunct to the other therapies to reach the person’s rehabilitation goals. This is not a visitation program, but one in which the carefully screened animals are used in a carefully orchestrated manner to reach therapeutic goals.
The results were only an indication of the possibilities of the many ways in which animal assisted therapy may be used in treatment. This study has not suggested that uses for animals other than those described in this study, such as animal visitation or resident animals, are not valid or important, but they are not the focus. The results are limited in their scope as they are true only for those clinicians who use animal assisted therapy in a manner similar to the program in place at this facility. The study does not attempt to generalize its results beyond the confines of this specific use of animal assisted therapy, or to other patient populations.

Other limitations included the limited sample size (only one facility was involved in the study). Also, the sample was taken from only one year of hospital admissions, and the criteria described in subject selection was very specific. No attempt was made to eliminate the possible differences that determined whether the person received animal assisted therapy or not. The specific nature of the study limits generalization of the data. This study, however, contributes statistically sound data to begin the process of building a body of knowledge about animal assisted therapy that may be useful for professionals in various disciplines.

A clear definition of animal assisted therapy with directives as to its use, as well as additional research would increase the amount of third-party payer knowledge of animal assisted therapy (Smith, 1995). The
statistical nature of the study may appeal to the medical community and lead to greater acceptance of this modality.

This study may also assist those desiring to begin an animal assisted therapy program. The results may be of interest to hospital administrators as well as supervisors of those desiring to begin programs. An animal assisted therapy program can be of benefit in public relations for the hospital. Animals make a facility feel more like home for clients and so the client may be more comfortable.

Animal assisted therapy can be successful in a managed care system. It is revenue producing and costs the hospital very little except the practitioner’s salary due to the volunteer involvement. The program also sets the facility apart from its competitors. The director at this facility has estimated that the program costs the facility about six dollars per volunteer for the identification badge, special collar, and leash. They also have a volunteer appreciation dinner once a year that the hospital pays for (Collins, 1996). The benefits far outweigh the minimal costs for the facility.

This study may assist all who work with animals. It is another piece of information about the bond between humans and animals. It suggests yet another way in which animals are important to humans. Those who train dogs to assist people, such as seeing eye dogs, may also be interested in this study.
The results of this study are exciting and will hopefully lead to more research in the various uses of animal assisted therapy. Animals can assist in the treatment of many diagnostic and population groups. However, more research needs to be done to determine the most effective use of these animals.
Appendix A

The Facility’s Altered FIM
# INTERDISCIPLINARY FIM STATUS REPORT

<table>
<thead>
<tr>
<th>REHAB SERVICE</th>
<th>THERAPIST</th>
<th>FUNCTIONAL INDEPENDENCE MEASURES (FIM)</th>
<th>ADM FIM</th>
<th>TC 1</th>
<th>TC 2</th>
<th>TC 3</th>
<th>TC 4</th>
<th>TC 5</th>
<th>LTG</th>
<th>DC FIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>OT</td>
<td>Eating</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Grooming</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Bathing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Dressing - Upper Body</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Dressing - Lower Body</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Toileting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSG</td>
<td>Bladder Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSG</td>
<td>Bowel Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT / OT</td>
<td>Transfer - Tub, Shower</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Toilet Transfer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT</td>
<td>Transfer - Bed, Chair, WC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>Locomotion - Wheelchair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>Locomotion - Walk</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PT</td>
<td>Locomotion - Stairs (requiring 12-14 stairs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT / SP</td>
<td>Comprehension - Auditory (A)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Visual (V)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT / SP</td>
<td>Expression Verbal (V)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Non-Verbal (N)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT / TR</td>
<td>Social Interaction</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT / SP</td>
<td>Problem-Solving</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OT / SP</td>
<td>Memory</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## FIM ASSISTANCE LEVEL EQUIVALENT

<table>
<thead>
<tr>
<th>FIM SCORE</th>
<th>FUNCTIONAL SCALE EQUIVALENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.0</td>
<td>Complete independence (timely, safely) Min: 150 ft. No Devices</td>
</tr>
<tr>
<td>6.0</td>
<td>Modified Independence (device) Min: 150 ft. (Walk / WC) With: Devices / Brace / Prosthesis</td>
</tr>
<tr>
<td>5.0</td>
<td>Supervision Min: 150 ft. (Walk / WC) SB Sup, Luring / Coaxing</td>
</tr>
<tr>
<td>4.0</td>
<td>Minimal Assistance (subject = 75%+) Min: 150 ft. Locomotion</td>
</tr>
<tr>
<td>3.0</td>
<td>Moderate Assistance (subject = 50%+) Min: 150 ft.</td>
</tr>
<tr>
<td>2.0</td>
<td>Maximum Assistance (subject = 25%+) Min: 50 ft. One Person Assist</td>
</tr>
<tr>
<td>1.0</td>
<td>Total Assistance (subject = 0%) Min: 50 ft. Two Person Assist</td>
</tr>
</tbody>
</table>
Appendix B

Client Data Sheet
CLIENT DATA SHEET

AAT: Yes or No

Baseline Data

Diagnosis:

- [ ] Right Hemisphere CVA
- [ ] Left hemiplegia
- [ ] Visual deficits
- [ ] Perceptual deficits
- [ ] Distractable
- [ ] Denial of problem with left side
- [ ] Impulsive behavior
- [ ] Dressing apraxia
- [ ] Difficulty crossing midline
- [ ] Other: ______________________

Date of CVA ______

- [ ] Left Hemisphere CVA
- [ ] Right hemiplegia
- [ ] Receptive aphasia
- [ ] Expressive aphasia
- [ ] Global aphasia
- [ ] Right visual field deficit
- [ ] Decreased computation skills
- [ ] Left/right confusion
- [ ] Deficits in memory
- [ ] Depression
- [ ] Motorapraxia
- [ ] Other: ______________________

Date of Birth ______

FIM score at initial evaluation ______________________

Date of initial evaluation ______

Treatment Process

Date treatment began ______

Days post-CVA ______

Length of time in treatment (Hours per day and number of days) ______________________

Number of treatments ______

Number of evaluations ______

Discharge Information

Date of final evaluation ______

FIM score at final evaluation ______________________

Date of discharge ______

Where did this person go after discharge? (Home or other facility) ______________________
Appendix C

Approval Letter From the Facility
Tyler Rehabilitation Hospital

TELECOPY COVER PAGE

CONFIDENTIAL

DATE: 1-6-97

NUMBER OF PAGES INCLUDIN G COVER PAGE: 2

IF YOU ARE NOT RECEIVING A CLEAR COPY OF THIS DOCUMENT OR ARE NOT RECEIVING ALL MATERIALS TRANSMITTED, PLEASE CONTACT US AT 913-

To: Alice Long

From: Shari Lussa

Note: This message is intended only for the use of the individual to whom it is addressed, and contains information that is privileged, confidential and exempt from disclosure under applicable law. If you are not the intended recipient, or the employee or agent responsible for delivering this message to the intended recipient, you are hereby notified that any unauthorized disclosure, dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please notify us immediately by telephone and return the original message to us at the address below via the U.S. Postal Service. Thank you.
January 6, 1997

Attention: Alice Briggs

Your proposal has been reviewed by Tyler Rehabilitation Hospital's Office of Administration and has been approved. Please contact me so we can plan what the next steps should be.

Sincerely,

[Signature]

Shari Bernard OTR
Senior OTR
Appendix D

Approval Letter From the Human Subjects
Institutional Review Board
Date: 10 January 1997

To: JoAnne Wright, Principle Investigator
   Alice Briggs, Student Investigator

From: Richard Wright, Chair

Re: HSIRB Project Number 96-10-21

This letter will serve as confirmation that your research project entitled "The Effects of Animal Assisted Therapy When Used as an Adjunct to Occupational Therapy in the Rehabilitation of Persons Who Have Had Cerebral Vascular Accidents" has been approved under the expedited category of review by the Human Subjects Institutional Review Board. The conditions and duration of this approval are specified in the Policies of Western Michigan University. You may now begin to implement the research as described in the application.

Please note that you must seek specific approval for any changes in this design. You must also seek reapproval if the project extends beyond the termination date. In addition if there are any unanticipated adverse reactions or unanticipated events associated with the conduct of this research, you should immediately suspend the project and contact the Chair of the HSIRB for consultation.

The Board wishes you success in the pursuit of your research goals.

Approval Termination: 10 January 1997
BIBLIOGRAPHY


Martin, S. (1993). What criteria should be used for pet therapy in critical care? Are you aware of any hospitals doing this?, *Critical Care Nurse*, April, 74.


Pet therapy used to treat emotional and physical disorders. (1986). *AARTimes: Association for Respiratory Therapy*, 10(11), 7.


Uniform Data System for Medical Rehabilitation (1993). *Guide for the uniform data set for medical rehabilitation (adult FIM version 4.0)*.
