

STRESS-ANXIETY AND LEARNING ACHIEVEMENT
IN HEMODIALYSIS PATIENTS

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

COLLEGE OF NURSING

BY
DOROTHY ELLEN ARCHER PARKER, B.S.N.

DENTON, TEXAS

AUGUST 1979

The Graduate School
Texas Woman's University
Denton, Texas

June 26 1979

We hereby recommend that the Thesis prepared under
our supervision by Dorothy Ellen Parker
entitled STRESS-ANXIETY AND LEARNING ACHIEVEMENT
IN HEMODIALYSIS PATIENTS

be accepted as fulfilling this part of the requirements for the Degree of
Master of Science

Committee:

Lois Hough

Chairman

Mildred Pittman

Ronald Michaels

Accepted:

Margaret J. Farrell
Dean of The Graduate School

The Graduate School
Texas Woman's University
Denton, Texas

June 26 1979

We hereby recommend that the Thesis prepared under
our supervision by Dorothy Ellen Parker
entitled STRESS-ANXIETY AND LEARNING ACHIEVEMENT
IN HEMODIALYSIS PATIENTS

be accepted as fulfilling this part of the requirements for the Degree of
Master of Science

Committee:

Lois Hough

Chairman

Mildred Pittman

Donald Michael

Accepted:

Margaret J. Furr
Dean of The Graduate School

ACKNOWLEDGEMENTS

I would like to express my appreciation to N. Kermit Olson, M.D., J. Patrick Brennan, M.D., and Michael L. Stoltz, M.D. for allowing me to follow their patients during acute and chronic periods of renal failure. These clinical experiences created the focus for this study. Additional appreciation is expressed to dialysis center nursing staff and dialysis unit nurses in two local hospitals for their assistance and encouragement. I am deeply indebted to the patients who shared with me their experiences, frustrations, and hopes.

Sincere appreciation is also expressed to Leroy Ford, PhD., Elizabeth Jean Pryor, R.N., M.S., Mary Ellen Wier, R.N., PhD., Robert W. Frost, director and staff of Instructional Media Department, South Campus-Tarrant County Junior College, and Charles W. Chadwick, director and staff of The Kidney Foundation of Texas, each of whom contributed their special expertise to make "Live With Your External Shunt or Internal Fistula" a model for multi-media patient education.

I am particularly appreciative of aid given by my thesis committee, students, family, friends, and especially my father, Maurice C. Archer, M.D., who has personified love and concern for patients. His example has influenced my choice of career, philosophy, and practice of Professional Nursing.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF TABLES	vii
 Chapter	
I. INTRODUCTION	1
Statement of Problem	2
Statement of Purposes	2
Background and Significance	3
Hypotheses	9
Definition of Terms	9
Limitations	10
Delimitations	11
Assumptions	12
Summary	12
II. REVIEW OF LITERATURE	14
Stress - Physiological Manifestations	14
Anxiety - Psychological Manifestations	21
Learning - Ability and Methods of Enhancement	25
III. PROCEDURE FOR COLLECTION AND TREATMENT OF DATA	32
Setting	33
Population	34
Tools	35
Data Collection	38
Treatment of Data	38

Chapter

IV. ANALYSIS OF DATA	41
Presentation of Findings	41
Demographic Data	41
Physiological Variables	44
Psychological Variable	45
Learning Achievement Variable	46
Additional Statistical Findings	49
V. SUMMARY, CONCLUSIONS, IMPLICATIONS, AND RECOMMENDATIONS	52
Summary	52
Conclusions	53
Implications	55
Recommendations	56
REFERENCES CITED	58
BIBLIOGRAPHY	64
APPENDIX A	66
Agency Permission	67
Research Committee Approval	68
APPENDIX B	69
Informed Consent Form	70
Study Description	71
APPENDIX C	73
Demographic Data Sheet	74
APPENDIX D	75
Self-Evaluation Questionnaire	76
APPENDIX E	77
Certificate of Copyright Registration	78
Pre-test	80
Objectives	83
Module Text	84
Post-test	107
Answer Sheet	110

APPENDIX F	111
Data Summary of Individual Patients	112

LIST OF TABLES

Table		Page
1	Demographic Data of Patients	42
2	Physiological Laboratory Values	45
3	Psychological and Learning Achievement Test Scores	47
4	Correlation of Learning Achievement With Study Variables	48
5	Correlation With Other Variables	50

CHAPTER I

INTRODUCTION

Drastic medical treatments and phenomenal technological advancement within the last twenty years have been referred to as a medical revolution. Most of what has occurred may be more properly termed evolutionary, since it is actually the rate of change which has been revolutionary. The effects of these dynamics on patients and families need to be soberly appraised. Technologically sophisticated therapies and the ensuing staggering costs of implementation lead health care professionals to recognize the need for involving patients in their own treatment and care. Safe and effective patient involvement can be achieved through use of proven teaching programs.

End-Stage Renal Disease with its predisposing or related diseases affects approximately thirteen million Americans. As the glomerular filtration rate decreases, certain chemical elements within the body increase creating a threat to homeostasis. Thrice weekly hemodialysis is administered to remove these undesirable metabolic elements and fluids which are incompatible with the homeostatic processes necessary to physiological and psychological functioning of the body.

Sustained changes in body functioning create states which alter patient response to teaching. The learning process is not necessarily related to the method or the efficiency of the teaching alone. Patients' awareness of their condition and understanding of their need for learning usually enhance their motivation to learn. When the physiological and psychological factors experienced by the patients in End-Stage Renal Disease alter understanding and motivation, learning is impeded. More effective teaching programs could be developed if the precise relationship between homeostatic dysfunctions and learning were known.

Statement of Problem

The problem of this study was to determine whether or not there is a relationship between selected homeostatic dysfunctions and learning achievement in patients actively receiving extracorporeal hemodialysis.

Statement of Purposes

The purposes of this study were to identify the relationship between learning achievement and:

1. Abnormal levels of carbon dioxide, potassium, blood urea nitrogen, and creatinine singly and combined.
2. Level of state anxiety.
3. All variables combined.

Background and Significance

An increased life expectancy has been the result of medical and pharmacological research. As life expectancy has increased, so has long term illness and disability. The challenge of nursing the chronically ill and disabled is great. Stryker (1972) emphasizes the need to provide a plan of care which incorporates activities for assessing learning needs of these patients and families, as well as meeting their physiological and psychological needs. One of the primary clinical nursing functions is that of observer-teacher. This function was assigned to nursing as early as the middle and late nineteenth century (Redman 1976).

Acknowledging the responsibility of every member of the health team to teach, Winslow (1976) emphasizes that it is the nurses who have the ability to assess patients' perspectives and teach on their level of understanding. Schlotter (1973) suggests that when patients understand their need for treatment, they have an increased desire to cooperate with their treatment regimen. As patients begin to adjust to their condition, they become more able to interact with the nurse-teacher. It is important to note that patients' perception of learning needs are sometimes at variance with the needs perceived by doctors and nurses. Dugas (1972) reports that patients want to know about their

illness and treatment, but often are reluctant to ask nurses questions because they seem so busy.

Wadsworth (1970) conducted a study on the perception of the nurse and the patient in identifying learning needs. She found that learning needs will vary with the patient's stage of illness. At first, patients will want to know about their new environment and then the disease process. At this point they will be most interested in the cause. Later, they will be interested in the diagnostic tests and therapeutic plan. As patients convalesce, concerns will be directed toward going home, adjustments following hospital dismissal, and problems to be faced.

Learning has been defined as discovery of meaning. It involves two steps. The first is acquisition of new information or experience, and the second is discovery of meaning to the individual. Valid evidence of learning is a change in behavior that persists. Dewey wrote that information in itself does not affect the learner significantly unless he is able to use it. Learning is more effective when a patient has the desire to learn and is ready for the experience. Motivation for learning is increased when the individual receives satisfaction from learning (Murray 1976). Studies have shown that motivation is affected more by internal stressors than by external stressors.

Several characteristics of learning need to be considered. The learner does not assimilate new knowledge, attitudes or skills unless he chooses to participate in the learning. Learning is creative for the learner must integrate what is learned into a pattern of action. Stryker emphasizes learning is influenced by: individual intellect; previous experience, both negative and positive; background knowledge; attitude toward content, as well as attitude toward teacher; and a need to see useful purpose for material being presented.

Several blocks to learning are identified in the literature. Stryker notes the task of learning may produce a sense of inadequacy and anxiety in adults, who too often equate "knowing" with being adult. In order to learn, persons must accept the fact that they do not have knowledge in a particular area. The activity of learning may produce resentment, insecurity, and a negative feeling toward authority. On the other hand, if learners are ready to learn, sensitivity, security, and increased self image may result.

Chronic illness and physical problems such as impaired vision and hearing deficit cause reduced energy level and shortened attention span. These factors affect the ability to learn. Inadequate kidney dialysis, medications, and fever also cause mental cloudiness and dullness of

understanding. Emotional reactions to illness influence the quality and speed of learning.

Anxiety is one of the most obvious and common reactions affecting learning. Psychologists and educators alike have recognized the negative effects of anxiety on achievement (Grooms and Endler 1960). Green (1964) indicates increased anxiety generally, but not uniformly, handicaps performance. Anxiety about the future, outcomes of illness, presence of pain and discomfort, changes in roles and functions of daily living are of great concern to patients. Anxiety is manifested in patients in many ways as well as in differing degrees. It can cause confusion, reduced learning, and non-compliance with treatment regimen. Symonds (1964) relates there is a fine thread differentiating anxiety and curiosity, which encourages approach, and anxiety and panic, which repels and initiates retreat. Individuals may vacillate from curiosity to panic suddenly and without warning.

Stress is related to anxiety in many ways. A distinction is that stress encompasses both physical and psychological factors. Selye, a pioneer investigator in the field of stress and body adaptation in health and disease, found stress is essential to life. He named the stress

which is vital to mind and body integrity, eustress, and stress detrimental to mind and body function, distress.

Stress has been most recently defined as the non-specific response of the body to any demand. Essentially, it is the rate of "wear and tear." The body responds to stress by the adaptive responses, alarm, resistance, and finally exhaustion, if relief is not obtained (Selye 1976). Selye's early definition of stress is especially appropriate to stress experienced by hemodialysis patients. He defined stress as a syndrome produced by diverse nocuous (noxious) agents.

Patients on hemodialysis have suffered renal failure due to acute or chronic End-Stage Renal Disease. These patients must receive dialysis treatments two or three times a week for the duration of their lives. The mortality rate for individuals with kidney disease is approximately 54,000 annually. This figure is approximately 7,500 greater than reported deaths caused by automobile accidents in 1976. An excess of 40,000 Americans have End-Stage Renal Disease, and more than 36,000 suffer from chronic renal disease (Kidney Foundation of Texas 1978).

The Social Security Administration estimates \$750,000,000 was spent on dialysis and transplant patients in 1977. An estimated \$150,000,000 was spent by states in

assistance programs for these patients. A conservative projection for the future, based on present trends, is that 55,000 Americans will be on dialysis by 1984 at a total cost to the Federal Government of 2.5 billion dollars. State governments will expend more than \$500,000,000 (Kidney Foundation of Texas 1978). In addition to the great number of individuals affected by End-Stage Renal Disease and the increasing cost of funding patient care, psychological and social stress on patients and their families creates crises which are not compatible to continuous maintenance of life.

Both patients and family members may consider hemodialysis initially as a gift of life, a panacea. Then, as the monotony of treatment, change in roles, life styles, relationships, and ever-increasing financial burdens take their toll, it becomes painfully apparent that dialysis can be both blessing and curse. The coveted treatment becomes both reliever and creator of stress. Patients often sense feelings of being tied to, or controlled by, the dialysis machines. Assisting hemodialysis patients to accept responsibility for their own care and helping them learn to manage routine aspects of their treatment is a challenge to the professional nurse. An even greater challenge is the study of the relationship of physiological factors and anxiety on the

learning processes of hemodialysis patients and implementation of these findings to enhance patient learning.

Hypotheses

To carry out the purposes of this study the following predictions were made. There will be a significant relationship between:

1. Learning achievement and each of the following physiological variables:
 - a. Carbon dioxide
 - b. Potassium
 - c. Blood Urea Nitrogen
 - d. Creatinine
2. Learning achievement and all physiological variables combined.
3. Learning achievement and level of state-anxiety.
4. Learning achievement and all physiological and psychological factors combined.

Definition of Terms

Within the limits of this study, the following terms were used:

Blood Urea Nitrogen (BUN)--Urea in the blood produced as a by-product of protein metabolism which increases as kidney failure develops. Normal blood value is 10-26 mEq per deciliter (dL).

Carbon Dioxide (CO₂)--Gas diffused in the blood.

The amount of CO₂ in the blood affects acid-base balance of body fluids. Normal blood value is 24-32 mEq per liter (L).

Creatinine (Cr)--Substance produced as by-product of muscle metabolism used as an indicator of normal and artificial kidney function. Normal blood value is .7-1.7 mg. per decileter (dL).

Learning Achievement--Increase between pre-test and post-test scores.

Potassium (K)--Electrolyte necessary for normal metabolic activities of all cells. An excess or deficit can be fatal. Normal blood value is 3.5-5 mEq per liter (L).

State-Anxiety--A transitory state in which the individual feels tense, apprehensive, or nervous.

Stress--Non-specific response of the body to any demand which calls for some type of adaptation.

Stress-Anxiety--Physiological and psychological response of the individual to chronic illness.

Limitations

Limitations for this study were as follows:

1. Study was conducted on patients in a single hemodialysis facility.
2. Convenience sample may not have been representative of all patients in the dialysis facility.

3. Subjects were selected on the basis of consent to participate.

4. Study was conducted while patients were receiving dialysis, which may influence responses other than those measured.

5. Subjects' level of understanding and capacity to learn was undetermined.

6. Learning achievement was tested only at the knowledge level as described by Bloom.

Delimitations

Delimitations for this study were as follows:

1. Subjects had End-Stage Renal Disease treated with hemodialysis.

2. Subjects had received a minimum of five dialysis treatments in the dialysis facility.

3. Subjects had blood chemistries drawn on the day of study.

4. Subjects were between twenty and sixty years of age.

5. Subjects had completed at least the ninth grade.

6. Subjects were chosen on the basis of ability to understand and read English.

Assumptions

The following assumptions were made for this study:

1. Individuals receiving dialysis experience some form of stress-anxiety.
2. Learning is altered in the presence of adverse conditions.
3. Motivation is necessary for learning to take place.
4. Decrements in post-test scores not exceeding ten points will be construed as resulting from variance in parallelism between pre-test and post-test.

Summary

Nurses are involved with the care of the patient with End-Stage Renal Disease during initiation, maintenance, and termination of thrice weekly extracorporeal dialysis. This contact provides an opportunity for the nurse-teacher to evaluate the patient's learning needs and stress-anxiety levels which affect learning achievement. The effects of stress-anxiety on learning achievement and a modular approach to learning are described in more detail in Chapter II. Chapter III describes the methods utilized to determine effects of stress-anxiety on learning achievement. The results and interpretation of the data collected are

included in Chapter IV. Chapter V contains a summary of findings. Conclusions are drawn, implications are cited, and recommendations are made which give direction for future study.

CHAPTER II

REVIEW OF LITERATURE

Focus of this study was to determine the relationship between learning achievement and selected homeostatic dysfunction in patients actively receiving extracorporeal dialysis. Guidance for this task was sought through researching the literature pertinent to the principles of stress, anxiety, and learning. Review of literature was ultimately categorized into sections to provide information in response to the following questions: (1) What are the stress factors in End-Stage Renal Disease (ESRD), and what effect do they have on cognition? (2) What is the prevalence of anxiety, and what effect does it have on patients with ESRD? (3) What is known about learning in the presence of ESRD, and what principles of learning should be utilized as a guide for development of an education module for patients with ESRD?

Stress - Physiological Manifestations

Stress as a health concept has been described in various terms. The word has been used to describe both physical deformity and mental and emotional disruption (Davies 1970). Selye was the first medical researcher to

adopt the term stress and apply it to the concept of health and disease. Stress was described as a syndrome or non-specific response produced by the body to demands made upon it. Essentially, stress is the rate of "wear and tear" caused by living and necessary for life. Stress is present in almost every disease, either as a cause or as a result of the condition. Selye concluded that stress is not necessarily bad unless the body is unprepared to respond to it, for a single stress may make one person ill, while another may find it an invigorating experience.

Response to stress is described as a protective mechanism enabling an individual to adapt to trauma and gradually regain homeostasis. Selye's formulation and testing of the general adaptation syndrome (G.A.S.) and identification of the side effects of "distress" brought about the realization that the origin of many common diseases lay in errors of adaptive response to stress rather than to damage directly related to life experience, microorganisms, or poisons. He found that many nervous and emotional disturbances, gastric and duodenal ulcers, hypertension and certain types of allergic, cardiovascular and renal derangements are apparently diseases of adaptation. Every organ and every chemical constituent of the body is involved during a general stress reaction. Physiological equilibrium is

maintained by the kidney during the G.A.S. through regulation of chemical composition of blood and tissues and selective elimination or production of certain substances. Based upon this understanding, it can be stated that failure of the kidney to maintain normal function, for whatever reason, creates a threat to maintenance of homeostasis during the G.A.S., and in the presence of ESRD poses a threat to maintenance of life. Bailey (1972) concluded that renal failure is a total body disease which manifests itself in every organ system, and ESRD is a life threatening crisis which must be resolved or death ensues. Studies of death and survival rates of patients on dialysis show that ESRD is terminal and that deaths occur in spite of regular dialysis (Moorhead et al. 1970, Siddique et al. 1970).

Stephenson (1977) cited a need for understanding the G.A.S. and associated signs and symptoms as a basis for assessment of the critically ill patient. She reported sources of stress can be divided into physical, chemical, biological, physiological, and emotional/social categories. Gutch and Stoner (1975) describe the common problems of uremia found in ESRD as those related to fluid overload, hypertension/hypotension, sepsis, electrolyte imbalance, and cerebral manifestations. Electrolyte imbalance can be identified through determination of levels of certain

electrolytes such as potassium (K) and the level of metabolic end-products such as carbon dioxide (CO_2), blood urea nitrogen (BUN), and creatinine (Cr). Formation of ammonia and excretion of titratable acids is decreased in ESRD. Bicarbonate wasting sometimes occurs and acidosis is present resulting in CO_2 levels below 15 mEq. (Schlotter). When renal function falls below 5% of normal, acidosis ensues. Metabolic acidosis is a constant factor in ESRD. Two major causes of metabolic acidosis are retention of by-products of protein metabolism (BUN, CR, and others) causing a decreased glomerular filtration rate with acid retention, and tubular defect in hydrogen-ion (H^+) excretion through ammonia production causing an increasing acid load and decreasing plasma CO_2 . A CO_2 level of 5 mEq. is the lowest reported in literature with survival (Bailey). Carbonic acid, formed when CO_2 enters the blood, decreases blood pH. Normally the body compensates for lowered blood pH by utilization of buffers and release of CO_2 from the lungs (Guyton 1976).

Collections of blood and pus, a hypercatabolic state, and acidosis contribute to hyperkalemia, and hyperkalemia in turn alters cardiac conductive mechanisms constituting a cardiac emergency (Freedman and Smith 1975). Management of the level of K is vital since a uremic patient

can neither excrete K overload nor conserve K efficiently. Normally K is present principally in the intracellular compartment. Concentration of K in the intracellular and extracellular compartments is affected by K balance with sodium (Na) and pH changes. An elevation of serum K is found in acidosis as acidosis causes K to leave the cells. Severe acidosis may cause cardiac arrhythmias, pulmonary vasoconstriction, and disturbances of mentation (Boedeker and Dauber 1976). Unsuspected accumulation of serum K may result in cardiac arrhythmias or cardiac arrest without previous warning. Bailey reports serum K levels greater than 8.0 mEq/L will lead to death if not treated promptly.

Signs of K intoxication are traced to neuromuscular and cardiac origins. Neuromuscular symptoms frequently observed are muscle weakness, paresthesia, or paralysis and reduction of deep tendon reflexes. While cardiac symptoms are less apparent, changes in EKG can be demonstrated (Johnson et al. 1975). Cellular K depletion caused by acidosis is present prior to dialysis and is corrected with the elevation of serum pH following dialysis (Moncrief and Decherd 1975). A stable patient will typically have a pre-treatment serum K level of 5.0-6.0 mEq/L. Post-treatment level would probably be 3.0-3.5 mEq/L. (Jacobberger 1977).

Blood urea nitrogen (BUN) is a principle waste product of dietary protein metabolism. As the kidneys fail, less urea is excreted causing an elevation of the serum BUN. Patients receiving regular dialysis may eat protein in carefully prescribed amounts, decreasing the incidence of poor nutrition and negative nitrogen balance, since urea is rapidly diffused across the dialyzing membrane of the artificial kidney.

Serum levels of creatinine (Cr), a by-product of muscle metabolism, have been found to be relative to amount of muscle mass in the individual. Usually a greater amount of physical activity produces a greater level of serum creatinine. Creatinine is a small molecule which diffuses easily across the dialyzing membrane. Clinically the level of Cr is monitored with BUN as an indicator of both normal and artificial kidney function.

Pre-dialysis levels of BUN in ESRD patients often range from 80-90 mg/dL with post-dialysis levels of approximately 30 mg/dL compared to the normal range of 8-18 mg/dL. Pre-dialysis levels of Cr are often between 10-15 mg/dL with post-dialysis levels of approximately 6 mg. compared to the normal 0.4-1.2 mg/dL (Jacobberger). Moncrief and Decherd note that terminal uremia occurs when the BUN level is greater than 100-120 mg/dL and serum Cr level is greater

than 10 mg/dL. Jacobberger relates that it is unknown presently to what extent urea and creatinine accumulations contribute to the clinical manifestations of renal failure. It is general knowledge, however, that the severity of the uremic syndrome is proportional to the degree of urea and creatinine retention and symptoms such as lassitude, loss of memory, inability to concentrate, depression, hostility, anger, dependency, fear, hallucinations, and paranoia are increased as uremia increases. Bailey reported similar findings noting that memory decreases, attention span shortens, ability to do "serial sevens" decreases, and performance of integrative tasks, such as dealing cards, is accomplished with great difficulty.

Research studies have shown the interrelationship of sleep disturbance to an increased BUN and conversely a subsequent enhancement of more normal sleeping patterns following regular hemodialysis (Passouant et al. 1970, McDaniel 1970). Decrements in cognitive functioning in patients maintained on chronic dialysis were correlated to "poisoning" represented by elevated serum levels of K and Cr (McDaniel). A study by Foster, Cohn and McKegney (1973) showed all patients to have some evidence of dialysis modified uremic encephalopathy. Some of the behavioral changes and neurovegetative symptoms which are present in incipient

stages of progressive uremia were also documented in these dialysis patients. Noted, however, was the fact that symptoms seemed to be arrested in the first stages of uremic encephalopathy since obvious delirium was absent. Mock (1975) concluded that hemodialysis is not as efficient as a functioning kidney and that while the dialyzing process corrects many of the chemical imbalances, alteration of psychological functioning is often present. While life can be prolonged in most instances, extreme psychological stress occurs in relation to the image of self, family, and society (Nordan et al. 1971).

Anxiety - Psychological Manifestations

Many references to anxiety of chronically ill patients and patients with ESRD are cited in the literature. Anxiety, as described by Menninger (1967), is an awareness of an uncomfortable or worried feeling or tension produced in response to forces from without or within which create psychic discomfort. Selye describes anxiety as a floating feeling of distress in which one experiences fear, but does not exactly know the cause of that which is feared. Anxiety is described by Peplau (1962) as a dynamic construct whose components contain certain observable signs and symptoms, and increased or decreased anxiety can be placed

on a continuum with degrees which can be identified along a graduated scale. Hazzard and Thorndal (1979) recognize that patient behavior, as a manifestation of anxiety, is related to experiences and the level of illness or wellness present. Similar expressions of anxiety have been noted by Brundage (1976) as she worked with patients exhibiting ESRD. Other pronounced psychological responses operationally related to anxiety were described as fear, hostility, resentment, regression, dependency, displacement, and aggression. Also mentioned were uncertainty, threat of death, and changes in body image (Kemph 1966, Denour 1970, Short and Wilson 1969, Santopietro 1975, Herrington and Brener 1973, Hansen 1972, and Nordan et al.).

Fisher (1976) wrote that there was a similarity between psychological problems of patients with renal diseases and other disability groups. He found that patients were often more disturbed by their perception of things which happened than by what actually happened. A corollary to this finding is that disease becomes an impediment to the body, but not to the will unless the individual allows it. Anxiety related to dialysis was classified by Wright, Sand, and Livingston and reported by Fisher in three categories: threatened or actual loss, threat of injury or injury, and frustration or deviation in drives. Fisher further revealed

the psychological aspects of patient reaction to observed stresses were varied. It is a general consensus that anxiety is present as a major aspect of the psychological reaction to ESRD, and a number of studies focus on the massive use of denial as a coping or defense mechanism (Fisher, Santopietro, Greenberg et al. 1975, and De Nour and Czaczkes 1972).

Short and Wilson describe denial as the initial phase of adjustment for the patient on maintenance dialysis. These same researchers have reported displacement, projection, reaction formation, and isolation as other defenses used. Frequent changes in mood were noted as increasing medical complications became apparent (Morgan et al. 1971). DeNour et al. (1968) described extensive use of defense mechanisms to relieve anxiety, but noted that patients were relatively free of psychiatric symptoms. Coping behaviors of patients under stress of dialysis were related to changes in social role, dependency, toxicity, and economic pressure (Cummins 1970). The harmful effects of denial were noted by Goldstein and Resnikoff (1971), for they wrote that problems must be realistically faced in order to be dealt with productively.

Systematic investigation of personality factors associated with dietary non-compliance (DeNour and Czaczkes

1972) indicated primary and secondary gains from the sick role were factors most commonly associated with non-compliance to dietary restrictions. Goldstein and Reznikoff saw dietary non-compliance as the patient's attempt to deal with anxiety resulting from recognition that he is responsible for his own survival. This finding could also be interpreted as an action akin to suicide or an effort to exert control in a circumstance in which the patient seems to have lost control.

Patients, after a time, respond more positively to the need to move on with living rather than clinging to dependency and denial. Anxiety can then be used in a more constructive way. At this point, patients can often express a need to establish "their optimum level of wellness" (Santopietro). A team approach encouraging the patient to take some responsibility for his own condition and to become actively involved in the maintenance of it is advocated by Nordan et al. It is clear that hemodialysis patients do not all respond to the same events in the same manner or to the same degree. An event which is catastrophic to one may be a challenge for adaptation for another. An approach to patient care which improves the psychological state enhances the climate for learning.

Learning - Ability and Methods of Enhancement

A paucity of material exists in the literature on the relationship of physiological effects of ESRD on the learning process. If mental cloudiness is present due to elevated levels of BUN, Cr, and K, and if decreased CO₂ values indicate metabolic acidosis, as reported by numerous authors, then the body physiologically represents a less than optimal media for learning. In addition, anxiety and distress caused by uncertainty and discomfort may not only block perception and the learning process, but also may increase the body's already maladaptive functioning.

Human behavior and the learning process have been of interest to philosophers and psychologists for centuries. Many theories have been advanced and empirically tested since the early twentieth century. Essentially, however, learning theory is incomplete as it presently exists (Gagne 1971). Two views of learning are recognized. One emphasizes learning as a change in patterns of behavior through acquisition of new responses or extinctions of old ones. The major contribution of this view is a reduction of theory to simplistic terms which can be tested and validated. Some of the researchers and their descriptive terms related to this point of view are: Pavlov - conditioning; Thorndyke-law of effect; Skinner - stimulus, response, reinforcement,

motivation; and Miller - motivation, cue, response, reward (Gagne, Miller 1957, Bigge 1971, Skinner 1965). Followers of the other view acknowledge learning as a composite of life experiences, biogenetic needs, ego needs, and development of insight or meaning. Testing these views is primarily clinical and descriptive. The results are interpreted subjectively through natural observation, clinical judgment, and personal experience (Luchins 1971).

Experimental and humanistic concepts for learning were systematized by James and Dewey. Dewey theorized that individuals learn to do by doing (experiential learning) and conditioning (pragmatic learning) as an active rather than passive process. Dewey felt information is internalized (learned) after it has been understood, tested, and found relevant. Freedom to test and accept or reject information is inherent in this view of learning. Gestalt or field theory of learning includes principles of order, laws of arrangement, spheres of influence, experience, and insight as bases for learning (Bigge). Cantor (1956) wrote that general learning is in essence self-learning.

Gagne (1966) describes learning as a change in capability which persists and is not simply the result of maturation. Utilizing present learning theories, Gagne (1971) describes a concept of learning stimulated through media of

communication by objects and events, still and moving pictures, diagrams, and printed and auditory messages. Striking similarity in concept and flow of learning and communication models was described by the National Education Association's Commission Monograph on Definition of Technological Development (NEA Report 1971).

Selecting learning theories most relevant to instruction is difficult. Prototype learning situations are stated as: (1) conditioning, (2) rote learning, (3) probability learning, (4) short term memory, (5) concepts, (6) perceptual motor skills, and (7) problem solving. The most important events of instruction are described as: gaining and maintaining instruction; facilitating recall; providing cues; giving feedback; facilitating remembering; and transfer and assessment. Gagne perceives learning as an individual matter and instruction as encompassing more processes than evident in learning theories.

Stimulation of the senses and awakening curiosity through audiovisual materials for enhancement of learning is generally acknowledged. Redman describes principles of learning: (1) learning is more effective when a student is ready to learn, (2) moderate anxiety is beneficial to learning; low or high levels of anxiety detract from learning, (3) reinforcement of desired behavior is necessary for

internalization of knowledge, (4) tasks too easy cause motivation lag; too difficult cause discouragement, (5) meaningful material is learned more readily and retained longer, (6) differences in meaning to individuals reflect variations in prior experiences, (7) learner must readily discriminate one skill from another, (8) inadequately suppressed interference between erroneous interpretations and correct interpretations cause the individual to become confused, (9) strengthening associations enhance ability to transfer knowledge, and (10) learning from general to specific is more efficient than the reverse approach.

Well designed media presentations based on generally accepted principles of learning allow the learner to be involved, to his capacity, in the steps of learning. Peplau (1952) outlines these as: observation, description, analysis, formulation, validation, testing, integration, and utilization. Major elements involved in audio-visual presentations are described as: (1) message - content or meaning, (2) media - instrumentation, materials, and devices, (3) personnel - skills required, (4) methods - specifications and techniques, and (5) environment - instructional situation (NEA Report).

Anxious responses and metabolic encephalopathy are known to affect patients' reactions, block ability to learn,

and alter perception of problems or tasks (Brundage and Murray). O'Neill (1971) reports patients' emotional factors and additional physical problems may affect "training." Also cited was a lack of standardization of patient education and clinical practice.

A survey of core curricula for dialysis programs by Hekelman and Ostendarp (1974) showed focus of education on tasks rather than learning. All programs reporting (31% of 108 questionnaires mailed) relied on demonstration and discussion for teaching, citing informality and one-to-one contact with patient as reasons for practice. Time and setting for learning occurred while patients were being dialyzed. Sixty-seven percent of reporting programs used patient centered objectives. Recommendations made by Hekelman and Ostendarp were: increased teacher familiarity with concepts of human needs, mastery of communication skills, improved assessment of patient readiness for learning and creating or selecting devices to measure patients' learning progress.

Review of available literature on patient education reveals greater emphasis on the teacher, methods of teaching, and subject matter rather than identification of learning needs and learning process relative to material to be learned. Two notable exceptions are views of Hekelman and

and Ostendarp (1975) and Redman. Need for use of nursing process for planning learning sequences, involving learner, and assistance to meet needs are stressed by Hekelman and Ostendarp. Concepts mentioned are: (1) learning through understanding effects of ESRD on body (cognitive), (2) adaptation to disease and changes in life style (affective), (3) learning new skills for self care (psychomotor). Redman reports facts or concepts are suited to intellectual (cognitive) learning and are accomplished through use of written materials, audio-visual aids (representation of concepts), and lecture or discussion. Attitudes (affective) are learned best through exchange of feelings and discussions which promote acceptance. Motor skills (psychomotor) are effectively learned by demonstration and return demonstration. Process for learning suggested by Redman includes: (1) assessment of need to learn, (2) assessment of readiness, (3) setting objectives for desired behaviors, (4) emotional and experiential involvement in learning, and (5) ongoing evaluation and revision of material as necessary.

It is evident from review of the literature that ESRD produces both physiological and psychological barriers to learning. An educational program developed for a population with ESRD should utilize proven methods which stimulate and guide the learning process, provide reinforcement,

reduce anxiety, and render denial unnecessary. The program should recognize and utilize the patient as partner in the process. Under these conditions, learner accomplishment should enhance understanding, encourage expression of feelings, and kindle motivation for compliance with prescribed treatment.

CHAPTER III

PROCEDURE FOR COLLECTION AND TREATMENT OF DATA

This study was conducted as a quantitative descriptive study. Fellin, Tripody, and Meyer (1969) describe this type of study as one which tests a hypothesis and searches for variable relationships. The study utilized a pre-experimental, one group pre-test, post-test design (Campbell and Stanley 1969). The interrelationship between observed phenomenon and learning achievement were quantitatively compared. Descriptive research as defined by Issac and Michael (1976), describes characteristics of an area of interest. One characteristic of this type of research is that it identifies problems or justifies current conditions or practices.

The purposes of this study were to examine the relationship between learning achievement and the independent variables: identified levels of carbon dioxide, potassium, blood urea nitrogen, creatinine, and state-anxiety as single and combined factors. The dependent variable, learning achievement, was identified as the increase in score

performance on the pre-test and post-test. This study was conducted in three phases which included development of a learning module, pilot testing, and the investigational phase from which data for this study were collected.

Setting

The setting for this study was an uncontrolled or natural setting. Non-experimental research is conducted in a natural setting, which is characterized by the absence of control over the environment (Abdellah and Levine 1970). A limited care, out-patient dialysis center in a large metropolitan area was used. The center maintains a three shift, five-hour treatment run schedule six days per week. A copy of the proposal for the study was presented to one of the medical directors of the facility and the nursing coordinator of inservice education. Agency permission was obtained before the study began (Appendix A).

The treatment area was composed of two large rectangular open rooms. Each room contained twenty patient units equipped with reclining chairs and dialysis apparatus. Small television sets provided diversion during the five to six hour treatment. Movable arms extending from a counter behind the units allowed television sets to be adjusted for individual patients' viewing. The nursing station was located at one end of the room on a raised platform. One

treatment room was decorated in bright yellow and orange. Five patient units faced each other on two aisles. The other room had bright blue and yellow decor. Four patient units faced each other on two aisles. Two glassed isolation units, located on each side of the room, contained separate dialysis apparatus. Two patients could be accommodated in each of these areas.

For the sake of convenience, testing and module viewing were administered in the large open treatment rooms during the mid-portion of the treatment. Stability of the subject's physical condition, general emotional calm, and fewer interruptions characterize the mid-treatment phase. Complications were more frequent during the last portion of the treatment.

Population

The population, or universe, for this study was all chronically ill End-Stage Renal Disease patients being treated by hemodialysis. The sample chosen was thirty-six patients from the metropolitan dialysis center, who met the delimitations set forth in this study. During the two-day data collection period, patients were selected from each shift by convenience and consent to participate. Convenience sampling is a non-probability sample selected for availability. It is not a true random sample; however,

there is an element of randomness of entry of subjects into the study (Abdellah and Levine). Subjects were assured that they would not be embarrassed in any way. Their right of privacy and anonymity was assured. Standard consent forms were signed by each of the participants (Appendix B). Reported data contained no identifiable descriptions, and no discomfort or risk was experienced by the subjects.

Tools

Each subject completed a demographic data sheet before beginning the study (Appendix C). The sheet was designed to facilitate collection of information from the subjects. Measurement of the independent variables, (CO₂, K, BUN, Cr) chosen to represent stress, was accomplished by securing and recording results of the pre-dialysis blood samples drawn on the mornings of the study. Laboratory values, accepted as normal by the center, were used for comparison criteria.

A standardized test developed by Speilberger, Gorsuch, and Lushene was used to identify the independent variable state-anxiety (Appendix D). Speilberger initiated the development of the tool in 1964 to provide objective self-report measures of both state and trait anxiety. The theoretical basis underlying the consturction of the State-Trait Anxiety Inventory (STAI) was that a measure of

state-anxiety should be sensitive to stress situations. In the four years after introduction of the test in 1970, the STAI was utilized in more than one hundred research studies. The inventory has been used to measure anxiety relating to a variety of topics, such as academic performance, counseling and desensitization, achievement, test anxiety, computer instruction, coping process, and feelings about dying.

Studies in the literature confirm Spielberger's claim that scores on A-State scale increase in the presence of stress and decrease with relaxation or reduced stress. Nine hundred seventy-seven undergraduate students at Florida State University were tested for state-anxiety (A-State) under normal and examination conditions. The mean score for the A-State test was greater in examination conditions (female=60.51, male=54.99) than in normal conditions (female=39.36, male=40.02). An A-State study of general medical surgical patients with psychiatric complications revealed a mean score of 42.35 and a standard deviation of 13.76.

For utilization in this study, the STAI Form X-1 (A-State) was self-administered by the patients. Twenty short statements rank present feelings into four categories: Not at all, somewhat, moderately so, or very much so. Tests were collected and filed with other data for later analysis.

A search of audio-visual sources and dialysis training programs revealed a lack of available commercial or "in-house" audio-visual modules on arteriovenous shunt and fistula management for patients. A two component module was developed. One component was a slide-tape presentation, "Living with Your External Shunt or Internal Fistula." Module objectives were used to develop the pre-test, post-test component for measuring learning achievement (Appendix E). Parallel items on pre- and post-tests were developed to minimize sensitization. A panel of three educators, two doctorally prepared and a third in doctoral preparation, reviewed the module. Recommendations of the two nursing educators and expert on modular learning were incorporated into the revised tests.

A pilot study was conducted using the module on two small groups of first and second year professional nursing students. Mean test scores for first year students were 63 on the pre-test and 92 on the post-test (46% gain). Second year students mean test scores were 84 on the pre-test and 90 on the post-test (7.1% gain). The difference of the means was determined to identify whether the change in scores was due to real or chance difference. The critical value for the difference of the means for the first year students was determined to be 1.54. The actual increase in

mean score was 29. The critical value for second year students was 1.43. The actual increase in the means was 6. Both groups tested in the pilot study showed a significant increase in means from pre-test to post-test indicating learning had occurred.

Data Collection

Blood samples, from which the physiological data were determined, were routinely obtained prior to dialysis on the last Monday and Tuesday of the month. This procedure dictated these two days be utilized for collection of all data required for analysis. Samples were drawn as treatment was initiated. Additional data were collected during the mid-treatment phase.

Learning was reinforced with a correctly keyed post-test following data collection. Participants were encouraged to take the test home and share it with family members, other patients, and friends. A registered nurse, prepared to assist with data collection, and the researcher explained procedures and answered questions before each segment of the study.

Treatment of Data

Demographic data, including age, sex, race, education, months on dialysis, and previous shunt care education, were summarized, using frequency distribution. Summary

statistics (mean, standard deviation, and range) were used to describe physiological variables (CO_2 , K, BUN, and Cr), State-Anxiety Test, and pre-test and post-test scores.

Multiple regression and correlation were used to determine interrelationships between the variables. Multiple regression is used in situations which have more than two variables, or when it is assumed that one of the variables is dependent upon the others (Zar 1964). Since computational procedures for most multiple regression and correlational analyses are complex, the computer was utilized for data analysis. Data were reported in writing to a statistician in the Computer Science Division of Southwestern Medical School.

The form of physiological and psychological relationships were explored singly and combined, using multiple linear regression techniques. Correlation coefficients of the physiological and psychological factors were calculated to assess the strength of linear relationships. Significance level for testing the hypotheses was set at .05 level.

Several models were investigated for the prediction of learning achievement.

1. Learning in the presence of the physiological variables:
 - a. Carbon dioxide
 - b. Potassium
 - c. Blood Urea Nitrogen
 - d. Creatinine

2. Learning in the presence of state-anxiety.
3. Learning in the presence of both state-anxiety and physiological variables.

This study was designed as a quantitative descriptive study. A pre-experimental, one group, pre-test, post-test design was used. Data were collected to measure stress-anxiety factors present and to study their relationship to learning achievement.

CHAPTER IV

ANALYSIS OF DATA

Thirty six patients with End-Stage Renal Disease presently under treatment in an outpatient hemodialysis center participated in this study. The purposes of this study were: to identify learning achievement in relation to the level of State-Anxiety and the presence of abnormal levels of CO₂, K, BUN, Cr; and to compare learning achievement with all variables singly and combined. Data were collected, analyzed, and summarized using descriptive statistics. Multiple correlation and multiple linear regression were utilized to show interrelationships between variables. Significance level for testing the hypothesis was set at $P < 0.05$.

Presentation of Findings

Demographic Data

Demographic data for the thirty-six patients are listed in Table 1. Complete data for each subject is provided in Appendix F. Twenty-one females (58.3%) and fifteen males (41.7%) ranging from twenty through fifty-six years of age participated in this study. Nine patients (19.4%) were between twenty and twenty-nine years of age. Six (16.7%)

TABLE 1

Demographic Data of Patients n=36

		Number	Percent
Sex	female	21	58.3
	male	15	41.7
Age by decades	20-29	9	19.4
	30-39	6	16.7
	40-49	14	38.9
	50-59	9	25.0
Racial origin	Black	12	33.3
	Mexican American	1	2.8
	White	23	63.9
Educational background in years of study	9	2	5.6
	10	5	13.8
	11	3	8.3
	12	15	41.7
	13	2	5.6
	14	4	11.1
	16	5	13.9
Experience on dialysis in months	1-12	13	36.1
	13-24	4	11.1
	25-36	10	27.8
	37-48	2	5.5
	49-60	4	11.1
	61-72	3	8.4
Previous shunt or fistula care education	Shunt care		
	Yes	12	33.3
	No	24	66.7
	Fistula care		
	Yes	26	72.2
	No	10	27.8
	No teaching	9	25.0

were between thirty and thirty-nine years of age. Fourteen (38.9%) were between forty and forty-nine years of age, and nine (25%) were between fifty and fifty-nine years of age. Mean age of the participants was 40.9 years.

Twelve patients were black (33.3%), one was Mexican American (2.8%), and twenty-three were white (63.9%). Their educational level ranged from nine to sixteen years. Two patients (5.6%) reported nine years of education. Five (13.8%) reported ten years. Three (8.3%) reported eleven years. Fifteen (41.7%) reported twelve years. Two (5.6%) reported thirteen years. Four (11.1%) reported fourteen years, and five (13.9%) reported sixteen years of education. Twenty-five (69.4%) of the patients had nine to twelve years of education. Eleven (30.6%) had between twelve and sixteen years of education. The mean educational level was 12.3 years.

Thirty-six patients represented a total of 987.5 months (82.3 years) of experience on hemodialysis. Thirteen (36.1%) of the patients had been on treatment twelve months or less. Four (11.1%) had been on treatment thirteen to twenty-four months. Ten (27.8%) had been on treatment twenty-five to thirty-six months. Two (5.5%) had received treatment thirty-seven to forty-eight months. Four (11.1%) had received treatment forty-nine to sixty months, and three

(8.4%) had received treatment for sixty-one to seventy-two months. The mean experience on hemodialysis was twenty-eight months.

Twelve patients (33.3%) reported some form of shunt care education, while twenty-four (66.7%) reported they had received none. Twenty-six patients (72.2%) reported some form of fistula care education, while ten patients (27.8%) reported they had received none. Nine patients reported they had received education (teaching) on neither shunt nor fistula care. Their experiences on hemodialysis were reported as one month, two and one-half months, eight months, nine months, eleven months, thirty months, forty-two months, and seventy-two months respectively.

Physiological Variables

The physiological variables CO_2 , K, BUN, and Cr were obtained from laboratory reports. Summary statistics for these variables are shown in Table 2. Blood serum levels of carbon dioxide were reported from an abnormally low 3 mEq/L to a nearly normal 22 mEq/L. The mean level was 13.6 mEq/L with a standard deviation of 4.27. All thirty-six patients were considered to be in various stages of metabolic acidosis. Serum potassium levels were reported from an abnormally low level of 1.8 mEq/L to an abnormally high level of 6.1 mEq/L. The mean level was

4.5 mEq/L with a standard deviation of 1.04. Five patients were considered hypokalemic, nineteen were within normal limits, and twelve were hyperkalemic. Serum BUN was reported from 31 mg/dL to 121 mg/dL. The mean level was 81.5 mg/dL with a standard deviation of 21.27. All patients had an elevated level of blood urea nitrogen. Serum Creatinine levels of 7.2 mg/dL to 23.7 mg/dL were reported. The mean level was 16.0 mg/dL with a standard deviation of 4.10. All patients had an elevated level of creatinine.

TABLE 2

Physiological Laboratory Values

Variable	Range	Mean	Standard Deviation
CO ₂	3-22 mEq/L	13.6 mEq/L	4.27
K	1.8-6.1 mEq/L	4.5 mEq/L	1.04
BUN	31-121 mg/dL	81.5 mg/dL	21.27
Cr	7.2-23.7 mg/dL	16.0 mg/dL	4.10

Psychological Variable

The A-state anxiety test was self-administered by the patients. Scores ranged from thirty-seven to sixty-eight. The mean score was 52.5, and the standard deviation

was 7.26. Mean score of the hemodialysis patients was 10.15 points greater than Spielberger's reported mean of general medical surgical patients with psychiatric complications and 9.82 points greater than Spielberger's reported mean of general medical surgical patients without psychiatric complications. Sixteen patients were above the 52.5 patient mean, seventeen were below the mean, and three scored at the mean.

Learning Achievement Variable

Learning achievement was measured by an increase in scores between pre-test and post-test. The tests were self-administered by the patients. Summary statistics for test results are shown in Table 3. The pre-test scores ranged from fifteen to ninety-five. The mean was 65.4 with a standard deviation of 20.58. The post-test scores ranged from 50 to 100. The post-test mean was 79.6 with a standard deviation of 13.91. Change in the means was assessed to determine whether the change in scores was due to a real or chance difference. The critical value for the difference between the means was determined to be 4.75. The observed increase in score averaged 14.2 units indicating that learning did occur.

TABLE 3

Psychological and Learning Achievement Test Scores

Test	Range	Mean	Standard Deviation
A-State	37-68	52.5	7.26
Pre-test	15-95	65.4	20.57
Post-test	50-100	79.5	13.90

Multiple correlation and multiple regression were used to identify relationships of the selected variables to learning achievement. Multiple correlation failed to show a significant relationship between learning achievement and any of the physiological variables studied at the $p < 0.05$ level (Table 4). Ranking of the physiological variables showed carbon dioxide ranking highest in relation to learning achievement ($r=0.261$ and $p=0.125$), followed by potassium ($r=0.169$ and $p=0.323$), blood urea nitrogen ($r=0.110$ and $p=0.522$), and creatinine ($r=-0.067$ and $p=0.697$). Based upon these findings, hypothesis one (There will be a significant relationship between learning achievement and each of the physiological variables: carbon dioxide, potassium, blood urea nitrogen and creatinine.) must be rejected. The alternate hypothesis of no significant relationship is assumed.

TABLE 4

Correlation of Learning Achievement
with Study Variables

Variable	Rank	Correlation Coefficient-r	Significance Level-p
CO ₂	1	-0.261	0.125
Anxiety	2	-0.197	0.249
K	3	0.169	0.323
BUN	4	0.110	0.522
Cr	5	-0.067	0.697

Analysis of learning achievement and all physiological variables combined using multiple linear regression yielded $p=0.31$. This finding indicates hypothesis two (There will be a significant relationship between learning achievement and all physical variables combined.) must be rejected. The alternate hypothesis, learning achievement is not significantly related to physiological parameters, is assumed.

The psychological variable, anxiety, and its correlation with learning achievement was $r=-0.197$ and $p=0.249$. Results of multiple regression produced the same significance level. These findings indicate that hypothesis three (There will be a significant relationship between learning

achievement and level of state-anxiety.) must be rejected. The alternate hypothesis, learning achievement is not significantly related to anxiety, is assumed.

Analysis of learning achievement and all physiological and psychological variables combined using multiple regression yielded $p=0.35$. On this basis, hypothesis four (There will be a significant relationship between learning achievement and all physiological and psychological factors combined.) must be rejected. The alternate hypothesis, learning achievement is not related to a linear combination of anxiety score and physiological variables, is assumed.

Additional Statistical Findings

Some correlations were found (Table 5). Post-test scores were inversely related to age ($r=-0.376$ and $p=0.024$). Education was significantly related to pre-test scores ($r=0.469$ and $p=0.004$) and post-test scores ($r=0.511$ and $p=0.002$). Experience on dialysis was significantly related to levels of K ($r=0.394$ and $p=0.018$), levels of BUN ($r=0.375$ and $p=0.024$), levels of Cr ($r=0.322$ and $p=0.055$) and learning achievement ($r=0.320$ and $p=0.058$). Creatinine levels were significantly related to levels of K ($r=0.586$ and $p=0.0002$) and levels of blood urea nitrogen ($r=0.586$ and $p=0.0013$). Post-test learning scores were significantly related to pre-test scores ($r=0.557$ and $p=0.004$). Learning

achievement was significantly related to pre-test scores ($r=-0.743$ and $p=0.0001$).

TABLE 5

Correlation With Other Variables

Variables	Correlation Coefficient-r	Significance Level-p
Post-test with age	-0.376	0.024
Education with pre-test	0.469	0.004
Education with post-test	0.511	0.002
Experience on dialysis with levels of K	0.394	0.018
Experience on dialysis with levels of BUN	0.375	0.024
Experience on dialysis with levels of Cr	0.322	0.055
Experience on dialysis with learning achievement	0.320	0.058
Creatinine with anxiety	0.398	0.016
BUN with K	0.586	0.0002
BUN with Cr	0.516	0.0013
Learning achievement with pre-test	0.743	0.0001
Post-test with pre-test	0.557	0.0004

Other findings, listed on Data Summary sheet for Individual Patients in Appendix F, showed one patient having a grossly decreased level of CO_2 (3 mEq/L), K (1.8 mEq/L), a slightly elevated BUN (31 mg/dL), Cr (8.7 mg/dL), an anxiety score of 48, a score of 40 on pre-test and 60 on poast-test (20 point gain). Another patient exhibited CO_2 (8 mEq/L), K (5.3 mEq/L), a greatly elevated BUN (90 mg/dL), Cr (18.8 mg/dL), Anxiety score 47, and pre-test score 15 with post-test score of 95 (80 point gain). Yet another patient exhibited a more nearly normal CO_2 (16 mEq/L), K (2.9 mEq/L), moderately elevated BUN (67 mg/dL), a greatly elevated Dr (17.7 mg/dL), Anxiety score of 68, pre-test score 70, and post-test score 85 (15 point gain).

Data from thirty-six hemodialysis patients were analyzed using descriptive statistics, multiple correlation and linear regression techniques. The relationships between learning achievement and physiological parameters, CO_2 , K, BUN, Cr, and the psychological variable, anxiety, were examined singly and combined. No significant relationships were found at the $p < 0.05$ level. Carbon dioxide and anxiety were identified as the variables nearest to significance in relation to learning achievement. Other variables were identified which showed significance at the $p < 0.05$ level.

CHAPTER V

SUMMARY, CONCLUSIONS, IMPLICATIONS AND RECOMMENDATIONS

Summary

The intent of this study was to evaluate the effect of stress-anxiety on learning achievement. This study was based on the philosophy that understanding, cooperation, and participation of patient and family are vital to compliance with treatment. Preparing patients and family members to actively participate in and accept responsibility for certain aspects of care is an important nursing function.

Relationships between selected homeostatic dysfunctions and learning achievement were studied. One purpose was to identify learning achievement in the presence of changing and usually abnormal levels of CO₂, K, BUN, Cr, and state-anxiety. Another purpose was to study the relationship of learning achievement to all variables singly and combined.

Review of the literature considered principles of stress, anxiety, and learning. Stress factors in End-Stage Renal Disease were identified and related to

cognition. The prevalence of anxiety and its effects upon patients were described. A paucity of literature exists on physiological effects of End-Stage Renal Disease and the learning process. Barriers to learning were cited. Principles of learning were described, and characteristics of efficient educational presentations were presented.

A pre-experimental, one group, pre-test, post-test design was used for this quantitative descriptive study. Blood samples were drawn immediately prior to treatment to determine physiological data. Written consent of participants, demographic data, and A-State results were obtained. A two-component module was utilized to facilitate learning and measure achievement. Data were statistically analyzed using frequency distribution, summary statistics, multiple correlation, and multiple linear regression. Results of statistical treatment of the variables failed to support the hypotheses at the $p < 0.05$ level of significance.

Conclusions

A significant difference in pre-test, post-test scores indicated learning achievement following module viewing. Although various stages of physiological dysfunction and varying levels of anxiety were experienced by the patients, learning occurred.

The relationship of metabolic acidosis (CO_2) to learning achievement came nearest to the $p < 0.05$ significance level ($p = 0.13$). Present state-anxiety was second in significance among variables studied ($p = 0.25$). These findings suggest that learning will be more effective as these two variables approach the mean or "norm" for hemodialysis patients. Analysis of the physiological and psychological variables individually or in combination failed to meet the selected significance level.

Failure of the data to support the hypotheses suggests that learning, in the presence of illness, is very complex. Other factors, as yet unidentified, probably act in combination with the study variables to influence the process of learning. This conclusion is supported by Kendler (1971) who reported unsuccessful attempts by learning theorists to study learning through relationships of independent environmental variables to dependent behavioral variables. Based upon the findings of the present study, the effect of the variables ultimately depends upon the individual and his holistic functioning. Study of data information for individual patients showed varying physiological and psychological patterns; however, the findings are too inconsistent to make predictions. From the information compiled and analyzed in this study, it is

concluded that numerous recognized and unrecognized variables play a part in the individual's response to disease and capacity to learn.

Implications

The following implications for education of patients with End-Stage Renal Disease were formulated from the results of this study:

1. Patients can be taught how to assist in management of their care.
2. The presence of abnormal physiological and psychological factors does not necessarily preclude the patient's ability to learn.
3. Identification of acidosis (CO_2) and recognition of abnormal anxiety levels can be used as indicators of impediments to learning.
4. Teaching programs can be effective during the mid-dialysis treatment phase.
5. Twenty minute teaching segments on a selected concept can produce measurable learning achievement.
6. Multi-media presentations appear to increase sensory perceptions, focus patient's attention, and facilitate learning.

Recommendations

It is recommended that further studies be designed to determine the effects of chronic debilitating illness upon learning. It is further recommended that this study be replicated utilizing these modifications:

1. Similar patient sample from another geographic location with limitation of age to the twentieth through the thirtieth year age groups.

2. Patient sample with equal division between male and female subjects to determine if level of anxiety is related to gender.

3. Patient sample with administration of Spielberger's anxiety inventory for both A-State and A-Trait.

4. Patient sample assessed for additional psychological variables, such as locus of control and patterns of coping.

5. Patient sample assessed for effect of presence or absence of family support systems comparing data with results of Spielberger's anxiety inventory for A-State.

Statistically significant information, derived from research dealing with chronically ill patients, increases empirical knowledge necessary for more efficient patient education. Learning achievement may be tested with pencil and paper; however, learning is demonstrated by changes in

behavior over a sustained period of time. Successful treatment of End-Stage Renal Disease is not only the maintenance of life through hemodialysis, but also the quality of life with emphasis on the ability to cope with daily living.

REFERENCES CITED

- Abdellah, Faye, and Levine, Eugene. Better Patient Care Through Nursing Research. New York: Macmillan Co., 1970.
- Bailey, George L. Hemodialysis Principles and Practice. New York: Academic Press, 1972.
- Bigge, Morris L. Learning Theories for Teachers. 2nd ed. New York: Harper & Row, 1971.
- Boedeker, Edgar C., and Dauber, James H. Manual of Medical Therapeutics. 21st ed. Boston: Little Brown & Co., 1976.
- Brundage, D. J. Nursing Management of Renal Problems. St. Louis: C. V. Mosby Co., 1976.
- Cantor, N. Dynamics of Learning. New York: Stewart, 1956.
- Cummins, J. W. "Hemodialysis: Feelings, Facts, Fantasies: the Pressures and How Patients Respond." American Journal of Nursing 70 (1) (1970): 70-76.
- Campbell, Donald, and Stanley, Julian C. Experimental and Quasi-experimental Designs for Research. Chicago: Rand McNally & Co., 1969.
- Davies, Peter, ed. The American Heritage Dictionary. Paperback ed. New York: Dell Publishing Co., 1974.
- DeNour, A. L., and Czaczkes, J. W. "Resistance to Home Dialysis." Psychiatric Medicine 1 (3) (1970): 207-221.
- DeNour, A. L., and Czaczkes, J. W. "Personality Factors in Chronic Hemodialysis Patients Causing Non-compliance with Medical Regimen." Psychosomatic Medicine 34 (4) (1972): 333-344.
- DeNour, A. K.; Sholtiel, J.; and Czaczkes, J. W. "Emotional Reactions of Patients on Chronic Hemodialysis." Psychosomatic Medicine 30 (5) (1968): 521-533.

- Dugas, Beverly W. Introduction to Patient Care. Philadelphia: W. B. Saunders Co., 1972.
- Fellin, Phillip; Tripody, Tony; and Meyer, Henry, eds. Exemplars of Social Research. Itaska, Illinois: Peacock Publications. Experimental Studies #1, 1969.
- Fisher, Stanley. "The Renal Dialysis Client: A Rational Counseling Approach." Rehabilitation Counseling Bulletin 19 (4) (June 1976): 556-561.
- Foster, F. G.; Cohn, G. L.; and McKegney, F. P. "Psychobiologic Factors and Individual Survival on Chronic Hemodialysis--A Two Year Follow-up: Part I." Psychosomatic Medicine 35 (1) (1973): 64-82.
- Freedman, Philip, and Smith, Earl C. "Acute Renal Failure." Heart and Lung 4 (6) November-December 1975): 874-878.
- Gagne, Robert M. "Learning Theory, Educational Media, and Individualized Instruction." To Improve Learning 2 (3) (1971): 61-74.
- _____. The Conditions of Learning. New York: Holt, Rinehart & Winston, 1966.
- Goldstein, A. M., and Resnikoff, M. "Suicide in Chronic Hemodialysis Patients From an External Locus of Control Framework." American Journal of Psychiatry 127 (9) (1971): 1204-07.
- Green, Donald Ross. Educational Psychology. One of a Series; edited by Richard S. Lazarus, Foundation of Modern Psychology Series. Englewood Cliffs, New Jersey: Prentice Hall, 1964.
- Greenberg, Irwin; Weltz, Sharon; Spitz, Cathy; and Bizzozero, Joseph. "Factors of Adjustment in Chronic Hemodialysis Patients." Psychosomatics 16 (4) (1975): 178-184.
- Grooms, R. R., and Endler, N. S. "The Effect of Anxiety on Academic Achievement." Journal of Educational Psychology 51: 299-304.

- Gutch, C. F., and Stoner, Martha H. Review of Hemodialysis for Nurses and Dialysis Personnel. St. Louis: C. V. Mosby Co., 1975.
- Guyton, Arthur C. Textbook of Medical Physiology. Philadelphia: W. B. Saunders Co., 1976.
- Hansen, G. L. Caring for Patients with Chronic Renal Disease. Philadelphia: J. B. Lippincott Co., 1972.
- Hazzard, Mary Ellen, and Thorndal, Mary L. "Patient Anxiety: Teaching Students to Intervene Effectively." Nurse-Educator 4 (1) (January-February 1979): 19-21.
- Hekelman, Francine P., and Ostendarp, Carol. "Development and Standardization of Core Curriculum for Home Dialysis Programs." Heart and Lung 3 (1) (January-February 1974): 117-121.
- Herrington, J. D., and Brener, E. R. Patient Care in Renal Failure. Philadelphia: W. B. Saunders Co., 1973.
- Issac, Stephen, and Michael, William B. Handbook in Research Evaluation. San Diego: EdIts Publishers, 1976.
- Jacobberger, Patricia V., Project Coordinator. Manual for End-Stage Renal Disease Training Program for State Agency Surveyors. DHEW pub. 1st Draft. 1977.
- Johnson, Katheryn H.; Kowalski, Lois M.; Braungardt, Carol J.; and Cotton, Kenneth E. "Nursing Care of the Patient in Acute Renal Failures." Nursing Clinics of North America 10 (3) (September 1975): 421-430.
- Kemph, J. P. "Renal Failure, Artificial Kidney and Kidney Transplant." American Journal of Psychiatry 122 (1966): 1270-1274.
- Kendler, Howard H. "Stimulus Response Psychology and A. V. Education." Audiovisual Process in Education: Selected Readings from A-V Communication Review. New York: Johnson Reprint Corp., 1971.
- Kidney Foundation of Texas. Dallas: Fact Sheet. 1978.
- Luchins, Abraham S. "Implications of Gestalt Psychology for A-V Learning." Audiovisual Process in Education: Selected Readings from the Communication Review. New York: Johnson Reprint Corp., 1971.

- McDaniel, J. W. "Metabolic & CNS Correlates of Cognitive Dysfunction with Renal Failure." Psychophysiology 8 (6) (1971): 704-713.
- Menninger, Karl. The Vital Balance. New York: Viking Press, 1972.
- Miller, N. E. "Graphic Communication and the Crisis in Education." National Education Association 5 (3) 1957.
- Mock, Lou, A.T. "Psycho-social Aspects of Home and In-Center Dialysis." Ph.D. dissertation, University of Houston, 1975.
- Moncrief, Jack W., and Decherd, Johnathan F. "Conservative Management of End-Stage Renal Failure." Texas Medicine 71 (January 1975): 74-79.
- Moorhead, J. F.; Baillod, R. A.; Hopewell, J. P.; Knight, A. H.; Crockett, R. E.; Fernando, O. N.; and Varghese, Z. "Survival Rates of Patients Treated by Home and Hospital Dialysis and Cadaveric Renal Transplantation." British Medical Journal 4 (1970): 83-85.
- Morgan, J. J.; Linton, P. H.; Hair, J. D.; Mentzer, H.; Odom, G. W.; and Brown, H. W., Jr. Final Report: A Comprehensive Study of the Rehabilitation Process in Patients in a Chronic Dialysis Program. 1971.
- Murray, Malinda. Fundamentals of Nursing. Englewood Cliffs, New Jersey: Prentice Hall Inc., 1976.
- National Education Agency. Annual Report. 1971.
- Nordan, Robert; Ostendorf, A. B.; and Naughton, John P. "Return to the Land of the Living: An Approach to the Problem of Chronic Hemodialysis." Pediatrics 48 (6) (December 1971): 939-945.
- O'Neill, Mary. "Guidelines for Teaching Home Dialysis." Nursing Clinics of North America 6 (4) (December 1971): 641-654.

- Passouant, P.; Cadilhac, K.; Baldy-Moulinier, M.; and Minon, C. "Night Sleep in Chronic Renal Insufficiency." Electroencephalography and Clinical Neurophysiology 29 (5) (1970): 441-449.
- Peplau, Hildegard E. Interpersonal Relations in Nursing. New York: G. P. Putman's Sons, 1952.
- _____. "Interpersonal Techniques: the Crux of Psychiatric Nursing." American Journal of Nursing 62 (6) n.d.: 43-53.
- Redman, Barbara K. The Process of Patient Teaching. St. Louis: C. V. Mosby Co., 1976.
- Santopietro, Mary and Charles S. "Meeting the Emotional Needs of Hemodialysis Patients and their Spouses." American Journal of Nursing 75 (4) (April 1975): 629-632.
- Schlotter, Lowanna. Nursing and the Nephrology Patient. Flushing, New York: Medical Examination Publishing Co., 1973.
- Selye, Hans. The Stress of Life. Paperback ed. New York: McGraw Hill Co., 1978.
- Short, M. J., and Wilson, W. P. "Roles of Denial in Chronic Hemodialysis." Archives of General Psychiatry 20 (4) (1969): 433-437.
- Siddique, J. Y.; Fitz, A. W.; Lawton, R. L.; and Kirkendal, W. M. "Causes of Death in Patients Receiving Long-Term Hemodialysis." Journal of American Medical Association 212 (8) (1970): 1350-1354.
- Skinner, B. F. "Reflections on a Decade of Teaching Machines." National Education Association. 1965.
- Stephenson, Carol A. "Stress in Critically Ill Patients." American Journal of Nursing 77 (11) (January 1977): 1806-1808.
- Stryker, Ruth P. Rehabilitative Aspects of Acute and Chronic Nursing Care. Philadelphia: W. B. Saunders Co., 1972.

- Symonds, Percival M. What Education Has to Learn From Psychology. 3rd ed. New York: Columbia University Bureau of Publications, 1964.
- Wadsworth, Patricia M. "A Study of Perception of the Nurse and the Patient in Identifying His Learning Needs." 1970. (Unpublished paper.)
- Winslow, Elizabeth H. "The Role of the Nurse in Patient Education." Nursing Clinics of North America 2:213-221.
- Zar, Jerrold H. Biostatistical Analysis. Englewood Cliffs, New Jersey: Prentice Hall, 1976.

BIBLIOGRAPHY

- Anger, Diane. "The Psychologic Stress of Chronic Renal Failure and Long-Term Hemodialysis." Nursing Clinics of North America 10 (3) (September 1975): 449-460.
- Burton, Benjamin T. "Current Concepts of Nutrition and Diseases of the Kidney." Journal of American Diabetic Association 65 (December 1974): 627-633.
- Clinesmith, Alice Ogden. "The Effect of Emotional Stress on Physical Health." Master's thesis, Texas Woman's University, 1976.
- Darcy, P. T. "Dynamic Aspects of Clinical Learning." Part I Nursing Mirror 141 (July 24, 1975): 59-60.
- . "Dynamic Aspects of Clinical Learning." Part III Nursing Mirror 141 (August 7, 1975): 69.
- del Bueno, Dorothy J. "Competency Based Education." Nurse Educator 111 (3) (May-June 1978): 10-14.
- . Individualized Instructional Systems for Vocational and Technical Education: A Collection of Readings. Edited by Mevin R. Frantz. Athens, Georgia: Vocational Instructional Systems, 1974.
- Fournet, Sr. Kathleen M. "Patients Discharged on Diuretics: Prime Candidates for Individualized Teaching by the Nurse." Heart and Lung 3 (1) (January-February 1974): 108-116.
- Freedman, Philip, and Smith, Earl C. "Acute Renal Failure." Heart and Lung 4 (6) (November-December 1975): 873-878.
- Grunland, Norman E. Measurement and Evaluation in Teaching. 3rd. ed. New York: MacMillan Publishing Co., 1976.
- Hassett, Marjorie. "Teaching Hemodialysis to the Family Unit." Nursing Clinics of North America 7 (2) (June 1972): 349-361.

- Herrscher, Barton R. Implementing Individualized Instruction. Houston: Archem Company Publishers, 1971.
- Jenrich, Judith A. "Some Aspects of the Nursing Care for Patients on Hemodialysis." Heart and Lung 4 (6) (November-December 1975): 885-889.
- King, Elizabeth Camp. "Constructing Classroom Achievement Tests." Nurse Educator 111 (5) (September-October 1978): 30-36.
- Levin, Lowell S. "Patient Education and Self Care: How Do They Differ?" Nursing Outlook (March 1978): 12-16.
- Lorig, Kate. "An Overview of Needs Assessment: Tools for Continuing Education." Nurse Educator 11 (2) (March-April 1977): 12-16.
- Sanders, Norris M. Classroom Questions: What Kinds. New York: Harper and Row, 1966.
- Temples, Betty Louise. "The Development of a Learning Module with Associated Literature Review Designed for the Nursing Care of the Postoperative Intestinal Bypass Patient." Master's thesis, Texas Woman's University (Houston), 1976.
- Wright, R. G.; Sand, P.; and Livingston, G. "Psychological Stress During Hemodialysis of Chronic Renal Failure." Annals of Internal Medicine 64 (1966): 611-21.
- Volicer, Beverly. "Perceived Stress Levels of Events Associated with the Experience of Hospitalization." Nursing Research 22 (November-December): 491-497.

APPENDIX A

AGENCY PERMISSION

RESEARCH COMMITTEE APPROVAL

TEXAS WOMAN'S UNIVERSITY
COLLEGE OF NURSING
DENTON, TEXAS

DALLAS CENTER
1810 Inwood Road
Dallas, Texas 75235

HOUSTON CENTER
1130 M.D. Anderson Blvd.
Houston, Texas 77025

AGENCY PERMISSION FOR CONDUCTING STUDY*

THE [REDACTED]

GRANTS TO Dorothy Ellen Parker

a student enrolled in a program of nursing leading to a Master's Degree at Texas Woman's University, the privilege of its facilities in order to study the following problem:

The problem of this study will be to determine the relationship between learning achievement and selected homeostatic dysfunction in patients actively receiving extracorporeal hemodialysis. The conditions mutually agreed upon are as follows:

1. The agency (may) (may not) be identified in the final report.
2. The names of consultative or administrative personnel in the agency (may) (may not) be identified in the final report.
3. The agency (wants) (does not want) a conference with the student when the report is completed.
4. The agency is (willing) (unwilling) to allow the completed report to be circulated through interlibrary loan.

5. Other: We will be glad to assist M. Parker in her investigation. However, strict codes of medical ethics must be followed.

Date 8-17-78

Dorothy E. Parker
Signature of student

[Signature]
Signature of Agency Personnel

Lois Hough
Signature of Faculty Advisor

*Fill out and sign three copies to be distributed as follows: Original -- Student; first copy - agency; second copy - T.W.U. College of Nursing.

TEXAS WOMAN'S UNIVERSITY
Human Research Committee

Name of Investigator: Dorothy Ellen Parker Center: Dallas

Address: 6157 Walla

Fort Worth,

Texas 76133

Dear Ms. Parker:

Your study entitled Stress-Anxiety Factors in Learning Achievement
has been reviewed by a committee of the Human Research Review Committee
and it appears to meet our requirements in regard to protection of the
individual's rights.

Please be reminded that both the University and the Department
of Health, Education and Welfare regulations require that written
consents must be obtained from all human subjects in your studies.
These forms must be kept on file by you.

Furthermore, should your project change, another review by
the Committee is required, according to DHEW regulations.

Sincerely,

Hester M. Homan
Chairman, Human Research
Review Committee
at Dallas

APPENDIX B
INFORMED CONSENT FORM
STUDY DESCRIPTION

TEXAS WOMAN'S UNIVERSITY

Consent to Act as a Subject for Research and Investigation:

I have received an oral description of this study, including a fair explanation of the procedures and their purpose, any associated discomforts or risks, and a description of the possible benefits. An offer has been made to me to answer all questions about the study. I understand that my name will not be used in any release of the data and that I am free to withdraw at any time.

Signature

Date

Witness

Date

Certification by Person Explaining the study:

This is to certify that I have fully informed and explained to the above named person a description of the listed elements of informed consent.

Signature_____
Date_____
Position_____
Witness_____
Date

STRESS-ANXIETY FACTORS IN LEARNING ACHIEVEMENT

Oral description of study used with consent Form B, Texas Woman's University.

Good morning, _____. I am a registered nurse; my name is _____. I am conducting a study on Stress-Anxiety Factors in Learning Achievement as part of the requirements for a Master of Science Degree from Texas Woman's University. I would like for you to participate in this study.

Subjects for this study must have End-Stage Renal Disease and be currently receiving hemodialysis. In order for you to participate, you must have received a minimum of five dialysis treatments in this dialysis facility. You must be able to read and understand English. You must have completed the ninth grade and be between twenty and sixty years of age. Do you meet each of these requirements?

Participation is voluntary. You will not be embarrassed in any way. Your privacy will not be violated and your tests will have a number rather than your name. There will be no discomfort or risks involved in this study. The results of the study will be used to develop more effective teaching programs for patients.

A self-evaluation questionnaire will be given to you. Following completion of this questionnaire, you will be given a pre-test to determine your present understanding of the external shunt and internal fistula. You will view a module

on "Living With Your External Shunt or Internal Fistula."

A post-test will be given to measure your learning achievement. Directions will be given to you for each of the activities I have mentioned.

Do you have any questions? If you would like to participate, please fill out the consent form and the demographic data sheet.

APPENDIX C
DEMOGRAPHIC DATA SHEET

TEXAS WOMAN'S UNIVERSITY STUDY-STRESS-ANXIETY
FACTORS IN LEARNING ACHIEVEMENT

PURPOSE of the research project is to identify learning achieved in the presence of hemeostatic changes in the patient on hemodialysis.

FINDINGS of the study will be used to develop more effective teaching programs for patients.

DEMOGRAPHIC DATA SHEET

Age _____

Sex _____

Race _____

Education _____

Years on dialysis _____

Previous teaching

shunt Yes No

fistula Yes No

I have been informed of the purpose of this study and the use of the findings. I agree to participate in this study.
Thank you for participating.

Signed _____

Date _____

Witness _____

Start run time _____

Finish Post-test _____

Start questionnaire _____

End run time _____

Finish questionnaire _____

Start Pre-test _____

Laboratory findings:

Finish Pre-test _____

CO₂ _____

Module _____

BUN _____

Start Post-test _____

Cr _____

K _____

APPENDIX D
SELF-EVALUATION QUESTIONNAIRE

SELF-EVALUATION QUESTIONNAIRE

Developed by C. D. Spielberger, R. L. Gorsuch and R. Lushene

STAI FORM X-1

NAME _____ DATE _____

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then blacken in the appropriate circle to the right of the statement to indicate how you *feel* right now, that is, *at this moment*. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1. I feel calm	①	②	③	④
2. I feel secure	①	②	③	④
3. I am tense	①	②	③	④
4. I am regretful	①	②	③	④
5. I feel at ease	①	②	③	④
6. I feel upset	①	②	③	④
7. I am presently worrying over possible misfortunes	①	②	③	④
8. I feel rested	①	②	③	④
9. I feel anxious	①	②	③	④
10. I feel comfortable	①	②	③	④
11. I feel self-confident	①	②	③	④
12. I feel nervous	①	②	③	④
13. I am jittery	①	②	③	④
14. I feel "high strung"	①	②	③	④
15. I am relaxed	①	②	③	④
16. I feel content	①	②	③	④
17. I am worried	①	②	③	④
18. I feel over-excited and "rattled"	①	②	③	④
19. I feel joyful	①	②	③	④
20. I feel pleasant	①	②	③	④



CONSULTING PSYCHOLOGISTS PRESS
577 College Avenue, Palo Alto, California 94306

APPENDIX E

CERTIFICATE OF COPYRIGHT REGISTRATION

PRE-TEST, OBJECTIVES, MODULE TEXT,
POST-TEST, AND ANSWER SHEET

CERTIFICATE OF COPYRIGHT REGISTRATION

FORM PA

UNITED STATES COPYRIGHT OFFICE

This certificate, issued under the seal of the Copyright Office in accordance with the provisions of section 410(a) of title 17, United States Code, attests that copyright registration has been made for the work identified below. The information in this certificate has been made a part of the Copyright Office records.

Barbara Rizer
 Register of Copyrights
 United States of America

REGISTRATION NUMBER	
PA	22-670
PA	PAU
EFFECTIVE DATE OF REGISTRATION	
Nov	27 1978
(Month)	(Day) (Year)

DO NOT WRITE ABOVE THIS LINE. IF YOU NEED MORE SPACE, USE CONTINUATION SHEET (FORM PA/CON)

1 Title	TITLE OF THIS WORK:	NATURE OF THIS WORK: (See instructions)
	LIVING WITH YOUR EXTERNAL SHUNT OR INTERNAL FISTULA	Audio Visual Work
PREVIOUS OR ALTERNATIVE TITLES:		
None		

2 Author(s)	IMPORTANT: Under the law, the "author" of a "work made for hire" is generally the employer, not the employee (see instructions). If any part of this work was "made for hire" check "Yes" in the space provided, give the employer (or other person for whom the work was prepared) as "Author" of that part, and leave the space for dates blank.	
	NAME OF AUTHOR: Parker, Dorothy Ellen	DATES OF BIRTH AND DEATH: Born... 1934 Died... (Year) (Year)
	Was this author's contribution to the work a "work made for hire"? Yes... No... X	
	AUTHOR'S NATIONALITY OR DOMICILE:	WAS THIS AUTHOR'S CONTRIBUTION TO THE WORK:
	Citizen of... USA (Name of Country) } or { Domiciled in... (Name of Country)	Anonymous? Yes... No... X Pseudonymous? Yes... No... X
	AUTHOR OF: (Briefly describe nature of this author's contribution) Sounds, recorded narration and slides.	If the answer to either of these questions is "Yes," see detailed instructions attached.
2	NAME OF AUTHOR:	DATES OF BIRTH AND DEATH: Born... Died... (Year) (Year)
	Was this author's contribution to the work a "work made for hire"? Yes... No...	
	AUTHOR'S NATIONALITY OR DOMICILE:	WAS THIS AUTHOR'S CONTRIBUTION TO THE WORK:
	Citizen of... (Name of Country) } or { Domiciled in... (Name of Country)	Anonymous? Yes... No... Pseudonymous? Yes... No...
	AUTHOR OF: (Briefly describe nature of this author's contribution)	If the answer to either of these questions is "Yes," see detailed instructions attached.
3	NAME OF AUTHOR:	DATES OF BIRTH AND DEATH: Born... Died... (Year) (Year)
	Was this author's contribution to the work a "work made for hire"? Yes... No...	
	AUTHOR'S NATIONALITY OR DOMICILE:	WAS THIS AUTHOR'S CONTRIBUTION TO THE WORK:
	Citizen of... (Name of Country) } or { Domiciled in... (Name of Country)	Anonymous? Yes... No... Pseudonymous? Yes... No...
	AUTHOR OF: (Briefly describe nature of this author's contribution)	If the answer to either of these questions is "Yes," see detailed instructions attached.

3 Creation and Publication	YEAR IN WHICH CREATION OF THIS WORK WAS COMPLETED:	DATE AND NATION OF FIRST PUBLICATION:
	Year... 1978... (This information must be given in all cases.)	Date... 10-3-78 (Day) (Month) (Year) Nation... USA (Name of Country) (Complete this block ONLY if this work has been published.)

4 Claimant(s)	NAME(S) AND ADDRESS(ES) OF COPYRIGHT CLAIMANT(S):
	Dorothy Ellen Parker 6157 Walla, Fort Worth, Texas 76133
TRANSFER: (If the copyright claimant(s) named here in space 4 are different from the author(s) named in space 2, give a brief statement of how the claimant(s) obtained ownership of the copyright.)	

- Complete all applicable spaces (numbers 5-9) on the reverse side of this page
 • Follow detailed instructions attached • Sign the form at line 8

DO NOT WRITE HERE
Page 1 of 2 pages

PA 22-670	EXAMINED BY: <i>el</i>	APPLICATION RECEIVED: JAN 23 1979	FOR COPYRIGHT OFFICE USE ONLY
	CHECKED BY:	DEPOSIT RECEIVED: 27 NOV 1978	
	CORRESPONDENCE: ☒ Yes	REMITTANCE NUMBER AND DATE: 58874 27 NOV 1978	
	DEPOSIT ACCOUNT FUNDS USED: ☐		

DO NOT WRITE ABOVE THIS LINE. IF YOU NEED ADDITIONAL SPACE, USE CONTINUATION SHEET (FORM PA/CON)

PREVIOUS REGISTRATION:

Photocopy application Jan. 11, 1979 Cash No. 58874 (P).

• Has registration for this work, or for an earlier version of this work, already been made in the Copyright Office? Yes No *X*

• If your answer is "Yes," why is another registration being sought? (Check appropriate box)

- ☐ This is the first published edition of a work previously registered in unpublished form.
- ☐ This is the first application submitted by this author as copyright claimant.
- ☐ This is a changed version of the work, as shown by line 6 of the application.

• If your answer is "Yes," give: Previous Registration Number Year of Registration

5

Previous
Registration

COMPILATION OR DERIVATIVE WORK: (See instructions)

PREEXISTING MATERIAL: (Identify any preexisting work or works that the work is based on or incorporates.)

.....
.....

MATERIAL ADDED TO THIS WORK: (Give a brief, general statement of the material that has been added to this work and in which copyright is claimed.)

.....
.....
.....

6

Compilation
or
Derivative
Work

DEPOSIT ACCOUNT: (If the registration fee is to be charged to a Deposit Account established in the Copyright Office, give name and number of Account.)

Name:

Account Number:

CORRESPONDENCE: (Give name and address to which correspondence about this application should be sent.)

Name: Dorothy Ellen Parker

Address: 6157 Walla

Fort Worth, Texas 76133

(City)

(State)

(ZIP)

7

Fee and
Correspondence

CERTIFICATION: * I, the undersigned, hereby certify that I am the: (Check one)

☒ author ☐ other copyright claimant ☐ owner of exclusive right(s) ☐ authorized agent of: Dorothy Ellen Parker

of the work identified in this application and that the statements made by me in this application are correct to the best of my knowledge.



Handwritten signature: (X) Dorothy E. Parker

Typed or printed name: Dorothy E. Parker

Date 1-18-79

8

Certification
(Application must be signed)

..... Dorothy Ellen Parker

6157 Walla

Fort Worth, Texas 76133

(City)

(State)

(ZIP code)

MAIL
CERTIFICATE
TO
13 FEB 1979
(Certificate will
be mailed in
window envelope)

9

Address
For Return
of
Certificate

* 17 U.S.C. 1506(a) FALSE REPRESENTATION—Any person who knowingly makes a false representation of a material fact in the application for copyright registration provided for by section 409, or in any written statement filed in connection with the application, shall be fined not more than \$2,500.

U.S. GOVERNMENT PRINTING OFFICE: 1978 - 361 - 022/18

July 1978 - 25,000

LIVING WITH YOUR EXTERNAL SHUNT OR INTERNAL FISTULA

PRE-TEST

DIRECTIONS: Read the question. Circle one answer and move on quickly to the next question. A list of correct answers will be given to you when you finish the last test. You may guess if you do not know the answer.

1. Which of the following types of connectors carries blood to and from the body:
 - a. blood line and pump
 - b. shunt and fistula
 - c. artificial kidney and dialysate solution
 - d. artery and vein
2. An external shunt is defined as:
 - a. an artificial joining of an artery and vein inside the body.
 - b. a plastic tube outside the body which mixes blood.
 - c. a tube joining an artery and vein outside the body.
 - d. a large single needle used in the groin which connects blood to the artificial kidney when the usual site is not working.
3. Which of the following activities is unsafe for a person with a shunt?
 - a. walking
 - b. crocheting
 - c. reading
 - d. hammering nails
4. A person who has a shunt should avoid:
 - a. daily cleansing of shunt area
 - b. wearing a bandage over shunt
 - c. getting bandage wet
 - d. routine activities
5. The shunt area should be cleansed daily to prevent:
 - a. high blood pressure
 - b. separation of the shunt
 - c. infection caused by dirt and dampness
 - d. clotting in shunt (cannulae)
6. Tight and constricting clothing cause:
 - a. pain in limb with shunt
 - b. reduced body motion
 - c. infection in the shunt
 - d. slowed blood flow and clotting

PRE-TEST

-2-

7. What serious and common problems may a person with a shunt experience?
 - a. dizziness, headache, loss of appetite
 - b. pain, bleeding, nausea
 - c. infection, clotting, hemorrhage
 - d. vomiting, high blood pressure, headache
8. Which of the following are signs of infection in the shunt area?
 - a. headache, nausea
 - b. separation of fluids, vomiting
 - c. visible clot, fever
 - d. redness, pain, drainage and pus
9. The answer which is not a sign of clotting in the shunt is:
 - a. visible clot
 - b. separation of fluids
 - c. chills
 - d. dark blue-red color
10. Correct action for a disconnected shunt is to:
 - a. call the doctor
 - b. wrap the shunt in a towel
 - c. try to reconnect the tubes
 - d. place a clamp across each end of the tubes
11. Choose the statement which is a disadvantage of the shunt:
 - a. may be used as soon as it is in place
 - b. causes more frequent clotting
 - c. produces discomfort from insertion of needles
 - d. begins treatment with simple procedure
12. An internal fistula is:
 - a. an artificial joining of an artery to a vein inside the body.
 - b. a plastic tube outside the body used to mix blood with dialysate fluid.
 - c. a tube which joins a vein and artery outside the body.
 - d. a large single needle used in the groin for connecting blood to the artificial kidney.
13. A person who has a fistula should avoid:
 - a. bathing daily
 - b. hitting or throwing objects
 - c. feeling fistula for buzzing twice daily
 - d. sleeping or resting on the fistula arm

PRE-TEST

-3-

14. Which of the following is most dangerous to a person with a fistula?
 - a. being stung by a bee
 - b. injuring arm or leg with fistula
 - c. daily exercise
 - d. gaining weight
15. Choose the action which is incorrect for care and protection of your fistula.
 - a. keep fistula area clean
 - b. report signs of infection to Doctor or Dialysis Center
 - c. check fistula for buzzing twice daily
 - d. have blood pressure taken in fistula arm
16. Choose the correct action for care and protection of the fistula.
 - a. report to Doctor or Dialysis Center bleeding or drainage from fistula
 - b. allow blood to be drawn from fistula arm
 - c. wear tight fitting clothing
 - d. expose fistula limb to extreme heat or cold
17. The two most serious problems affecting a person who has a fistula are:
 - a. pain and weakness
 - b. nausea and vomiting
 - c. infection and clotting
 - d. loss of appetite and sleeplessness
18. Choose the answer which is not a sign of infection around the fistula.
 - a. redness
 - b. dark blue color
 - c. swelling
 - d. fever
19. A sign of clotting in the fistula is:
 - a. absence of buzzing or pulsation
 - b. muscle cramps
 - c. headache
 - d. weight loss
20. An advantage of the fistula is that the fistula:
 - a. uses needles for dialysis treatment
 - b. does not require special care between treatments
 - c. may be used as soon as it is in place
 - d. reduces dialysis time

PATIENT EDUCATION MODULE

LIVING WITH YOUR EXTERNAL SHUNT OR INTERNAL FISTULA

OBJECTIVES

FOLLOWING THE VIEWING OF THE MODULE, THE LEARNER WILL BE ABLE TO:

1. Recall two means of connecting blood from your body to artificial kidney during dialysis.
2. Select the appropriate definition for an external shunt.
3. Choose appropriate activities for care and protection of a shunt.
4. Recall three most common and serious problems facing a person with a shunt.
 5. Identify the signs of infection in the shunt area.
6. Identify the signs of clotting in the shunt.
7. Recall correct emergency treatment for a disconnected shunt.
8. Recall advantages and disadvantages of the shunt.
9. Select the appropriate definition for an internal fistula.
10. Choose appropriate activities for care and protection of a fistula.
11. Recall the two most important problems experienced by a person with a fistula.
 12. Identify the signs of infection at the fistula site.
 13. Identify signs of clotting in the fistula.
14. Recognize the advantages and disadvantages of the fistula.

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 1

2

3

Drawing, picture, or description of scene--with action of movement noted.

Graphic illustration.

Living With Your External Shunt or Internal Fistula

©1978

Dorothy Ellen Parker, R.N.
B.S.N.

Patient in dialysis unit talking to dialysis technician.

College age female on dialysis.

NARRATION

Renal failure no longer

spells doom for you!

Successful treatment and

care is now the rule

rather than the exception.

You can learn to manage the routine aspects of

your own care. This module

will help you understand

the two most common types

of access used for hemo-

dialysis.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 4

5

6

Drawing, picture, or description of scene-with action of movement noted.

Young man during dialysis

Arm with external shunt

Arm with internal fistula

NARRATION

If you are presently

The two most common

receiving or about to

methods are the external

begin dialysis, you will

shunt and the internal

know that you need some

fistula.

means to connect blood

from your body to the

artificial kidney.

REMARKS

TITLE _____

SCENE #

7

#

8

#

9

Drawing, picture, or description of scene--with action of movement noted. Graphic. External Shunt. Dialysis access outside body.	Graphic. External Shunt	Male adult during dialysis treatment; shows dialysis apparatus.
--	------------------------------------	--

NARRATION

Let's talk first about the external shunt.	An external shunt has two special tubes which carry blood from an artery directly to a nearby vein. These small tubes are called cannulas. One cannula, or tube, is surgically placed into an artery in your forearm or just above the ankle. The other cannula or tube is placed into a nearby vein in the same arm or ankle.	During hemodialysis, the cannula, or tube, in your artery is attached to another tube which carries blood to the artificial kidney. The other cannula in your vein receives the purified blood from the artificial kidney and returns it to your body. After dialysis, cannulas are joined to form a shunt, an artificial joining which remains in your arm or leg at all times.
---	---	---

REMARKS

15

Feeling for pulsation -
shunt arm.

Bandaged shunt.

between treatments.

Pulsation or buzzing
is present when the

shunt is working correctly.

A bandage is worn over the shunt to protect it

from accidental dissection, injury or infection.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 16 # 17 # 18

Drawing, picture, or description of scene--with action of movement noted. Application of waterproof covering over bandage.	Completed protective wrap.	Graphic listing signs of infection - shunt.
---	----------------------------	---

NARRATION

Waterproof plastic should be applied over the shunt dressing before bathing or showering.	A plastic sack or transparent wrap; sealed with tape will protect the shunt.	Signs of infection around the shunt are: 1. Redness around the cannula entry site
		2. Pain
		3. Swelling
		4. Drainage from the cannula entry site.

REMARKS

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

	#	<u>20</u>	#	<u>21</u>
SCENE #		<u>19</u>		

Drawing, picture, or description of scene-with action of movement noted.

Physician talking with patient.

Physician taking blood
pressure in arm without
shunt.

Girl wearing dress with
tight arm cuff.

NARRATION

Your doctor should be contacted if any signs of infection appear.	Blood pressure should not be taken in the arm with the shunt, since this may decrease circulation and cause a blood clot to form in the shunt.	You should not wear tight clothing or clothing with tight fitting arm or leg bands. Extremes of heat or cold may cause spasms of the veins which may
--	---	---

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 22

23

24

Drawing, picture, or description of scene-with action of movement noted.

Girl sleeping on shunt arm.

Proper position for sleeping.

Exposed shunt arm; inspect for color.

NARRATION

Prolonged bending of

You must learn to rest

Check the color of blood

wrist or ankle or sleeping

or sleep so that body

flowing through the shunt

or resting on the shunt

weight will not slow the

several times a day. The

area causes pressure and

normal blood flow.

color should be rose-red.

slows the blood flow.

A dark bluish-red color

indicates that a clot may

have formed.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 25

26

27

Drawing, picture, or description of scene-with action of movement noted.

Shunt segment showing clot.

Shunt bandage with special hemastatic clamp.

Clamps in place on separated shunt.

NARRATION

You may be able to see

the clot or notice that

the blood has separated

into dark and clear

fluids. If this happens,

contact your doctor or

the dialysis center at

once.

Two light-weight clamps

should be worn at all

times. They should be

clipped to the shunt

bandage where they can

be used in an emergency

if the shunt is accidentally

separated.

In the event of separation,

place a clamp on the end

of each cannula. The

clamp must be placed

perpendicular to the

tubing to stop the blood

flow.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 28

29

30

Drawing, picture, or description of scene-with action of movement noted.

Injection being given in arm without shunt.

Graphic.
Most common problems.

Graphic.
Summary of the shunt.

NARRATION

You should avoid puncture of veins or injections into the muscles of the arm or leg with the shunt.

The most common problems you may experience are infection, clotting, and accidental separation of the shunt.

Let's compare the advantages and disadvantages of the shunt.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 31

32

33

Drawing, picture, or description of scene-with action of movement noted. Graphic. Advantages.	Graphic. Disadvantages.	Graphic. Do.
---	------------------------------------	-------------------------

NARRATION

1. May be used as soon as it is in place.	1. Daily cleansing and re-dressing are necessary.	You should: Limit movement of arm to mild routine activities.
2. No discomfort caused by needle puncture.	2. There is a greater possibility of infection.	Wear a bandage to protect shunt.
3. Simple procedure to begin dialysis.	3. More frequent clotting.	Keep the bandage dry.
	4. Possibility of separation of cannula and hemorrhage.	
	5. Limited movement of cannulated limb.	
REMARKS	Now, let's review what we have said about the shunt.	

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 34

35

36

Drawing, picture, or description of scene-with action of movement noted.

Graphic.

Do (Continued).

Graphic.

Do (Continued).

Graphic.

Do (Continued).

NARRATION

Observe the cannula site

for signs of infection:

Rodness

Pain.

Swelling.

Drainage.

Fever

Other signs of infection

are muscle aches and

chills.

Call your doctor is

signs of infection are

present.

Wear two light-weight

clamps on bandage.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 37

#

38

39

Drawing, picture, or description of scene-with action of movement noted.

Graphic.

Do (Continued).

Graphic.

Do Not.

Graphic.

Do Not (Continued).

NARRATION

Check shunt for signs of

clotting:

Visible clot.

Separation of fluids.

Dark blue-red color

You should avoid:

Shaking, throwing, or hitting objects.

Getting bandage wet.

Having blood pressure taken in shunt area.

Wearing tight or con-

stricting clothing on arms or legs.

Exposing cannulated arm or

leg to extremes of heat or cold.

Flexing of arm or leg

for a prolonged period of time.

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE #

40

41

42

Drawing, picture, or description of scene-with action of movement noted.

Graphic.

Do Not (Continued).

Graphic.

Internal fistula; dialysis access inside the body.

Graphic.

Illustration of internal fistula.

NARRATION

Sleeping or resting posi-

tions which reduce blood

flow to cannulated limb.

Having puncture of veins or

injections into muscles of

the cannulated limb.

The second common method

of access or entry for

hemodialysis is the

internal fistula.

An internal fistula is an

artificial connection

joining an artery and a

vein under the skin. A

minor surgical procedure

allows arterial and venous

blood to mix.

REMARKS

TITLE Living With Your External Shunt or Internal Eistula

SCENE # 43 # 44 # 45

Drawing, picture, or description of scene-with action of movement noted. Arm showing enlarged vein with needle marks.	Graphic. Facts about your fistula.	Arm and hand showing working fistula.
---	--	--

NARRATION

Increased blood flow under high pressure causes the vein to enlarge. An enlarged vein is easier to locate and allows less painful insertion of dialysis needles.	Here are some important facts you should know about fistula:	One advantage of the fistula is that it does not require special care between treatments. There is no danger of the fistula becoming loose or separating; and, movement of the limb is not restricted. It takes several weeks for the fistula to become large enough to be entered easily by the dialysis needle.
---	---	--

REMARKS

TITLE _____		# _____	# _____
SCENE # <u>46</u>		# <u>47</u>	# <u>48</u>
Drawing, picture, or description of scene-with action of movement noted. Physician giving directions for care to young woman.	Cleansing of fistula arm.	Administration of local anesthetic.	
NARRATION			
Your doctor may give you special instructions to help the fistula vein enlarge so it can be used more quickly.	The area of the fistula must be carefully cleaned before needles are inserted. This is particularly important when profuse sweating or dirt accumulation is present.	A local anesthetic may be used to permit needle insertion.	
REMARKS			

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 49

50

51

Drawing, picture, or description of scene-with action of movement noted.

Graphic.

Signs of infection.

Graphic.

Signs of clotting.

Graphic.

Summary of the fistula.

NARRATION

Infection of the fistula

site is a problem which may

occur. Signs of infection

are:

1. Redness of skin over

fistula

2. Pain

3. Swelling

4. Drainage from needle site.

5. Generalized muscle aches

Clotting is another problem which may occur in the

fistula. Signs of clotting are:

1. The disappearance of vein pulsation or buzzing which

can be felt with the fingers over the fistula

site.

2. The disappearance of sound produced by movement of blood.

3. Pain

4. Swelling

If signs of clotting or in-

fection are present, contact

your doctor or the dialysis

center at once.

Let's compare the

advantages and disadvantages

of the fistula.

REMARKS 6. Chills

7. Fever

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 52

53

54

Drawing, picture, or description
of scene-with action of movement
noted.

Graphic.
Advantages.

Graphic.
Disadvantages.

Graphic.
Do.

NARRATION

1. Does not require

special care between

treatments.

2. No danger of fistula

becoming loose or

separating.

3. Movement of the limb is

not restricted.

1. Needles must be used

for each dialysis

treatment.

2. New fistula may take

several weeks to

mature.

Now let's review what

we have learned about

fistulas.

Observe needle entry

site for signs of

infection:

Redness

Pain

Swelling

Drainage

Fever

REMARKS

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 55

56

57

Drawing, picture, or description of scene-with action of movement noted. Graphic. Do (Continued).	Graphic. Do (Continued).	Graphic. Do (Continued).
---	-------------------------------------	-------------------------------------

NARRATION

Keep skin on fistula area clean.	Observe fistula site for signs of clotting:	Report any signs of infection to doctor or dialysis center.
Other signs of infection are muscle aches and chills.	Absence of buzzing Swelling Pain or discomfort	Feel fistula for buzzing twice daily.
REMARKS		

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 58 # 59 # 60

Drawing, picture, or description of scene-with action of movement noted. Graphic. Do Not.	Graphic. Do Not (Continued).	Arm with shunt.
---	---	------------------------

NARRATION

Avoid:	Flexing fistula arm or leg if located near a joint.	In the event that the internal fistula fails to function properly, an external shunt may be used for dialysis temporarily or until the new fistula is ready for use.
Injuring arm or leg which has fistula.		
Having blood pressure taken in fistula arm.	Sleeping or resting positions which cause pressure on fistula.	
Wearing bands or tight constricting clothing on fistula arm or leg.		

REMARKS

[illegible]

TITLE Living With Your External Shunt or Internal Fistula

SCENE # 64 # 65 # 66

Drawing, picture, or description of scene-with action of movement noted. Adult male playing pingpong.	Script by Dorothy Ellen Parker, R.N., B.S.N.	Produced by TCJC, South Campus Instructional Media Staff.
---	---	--

NARRATION

you can face life with hope . . . and satisfaction, as you continue your work and pursue your interests.		
---	--	--

REMARKS

--	--	--

LEARNING MODULE

SELECTED BIBLIOGRAPHY

- Bailey, George L. Hemodialysis Principles and Practice. New York: Academic Press, 1972.
- Hansen, G. L. Caring For Patients With Chronic Renal Disease. Philadelphia: J. B. Lippincott Co., 1972.
- Harrington, J. D., and Brener, W. R. Patient Care in Renal Failure. Philadelphia: W. B. Saunders Co., 1973.
- Jacobberger, Patricia V. End-Stage Renal Disease Training Program For State Agency Surveyors. DHEW Pubn. RFP HSA-240-BOA-77 (7) 1977.
- Jenrich, Judith A. "Some Aspects of Nursing Care For Patients on Hemodialysis." Heart and Lung 4 (November-December 1975): 885-889.
- Juliani, Louise, and Reamer, Bonita. "Kidney Transplant: Your Role in Aftercare." Nursing 77 7 (October 1977): 46-51.
- McNamara, Rose Marie. "The Bioinstrumentation of Hemodialysis." Nursing Clinics of North America 13 (December 1978): 611-23.
- U. S. Department of Health, Education, and Welfare. Living With End-Stage Renal Disease. Pubn. No. 76-3001. (1976): 14-17.

LIVING WITH YOUR EXTERNAL SHUNT OR INTERNAL FISTULA

POST-TEST

DIRECTIONS: Read the question. Circle one answer and move on quickly to the next question. A list of correct answers will be given to you when you finish the last test. You may guess if you do not know the answer.

1. Two means of connecting blood from your body to the artificial kidney during dialysis are:
 - a. artery and vein
 - b. blood line and pump
 - c. shunt and fistula
 - d. needles and dialysate solution
2. An external shunt is best described as:
 - a. two tubes (cannulae) placed in an artery and vein.
 - b. an artificial connection of an artery and a vein which causes enlargement of the vein.
 - c. a new method of dialysis treatment using an improved artificial kidney.
 - d. an outside passage which allows blood to mix with dialysate fluid.
3. A person who has a shunt should avoid:
 - a. throwing or hitting objects
 - b. mild activity
 - c. bathing
 - d. wearing a bandage
4. The shunt bandage is protected from getting wet by:
 - a. not bathing
 - b. taping plastic wrap over bandage when bathing
 - c. taking a shower
 - d. covering it with a wash cloth
5. Daily cleansing and redressing of the shunt prevents:
 - a. high blood pressure
 - b. infection caused by dirt and dampness
 - c. clotting in the shunt (cannulae)
 - d. separation of the shunt
6. Tight and constricting clothing should not be worn because:
 - a. blood flow is slowed and clots may form
 - b. body motion is reduced
 - c. pain may be caused
 - d. loose clothing is in style

Copyrighted Material 1978 Dorothy Ellen Parker, R.N., B.S.N.
May not be reproduced without the written permission of the author.

POST-TEST

-2-

7. Three most serious and common problems facing a person with a shunt are:
 - a. pain, bleeding, nausea
 - b. vomiting high blood pressure, headache
 - c. dizziness, headache, loss of appetite
 - d. infection, clotting, hemorrhage
8. Signs of infection in the shunt area are:
 - a. separation of fluids, pain
 - b. redness, pain
 - c. visible clot, fever
 - d. nausea, headache
9. Choose the answer which is not a sign of clotting in the shunt.
 - a. chills, fever
 - b. visible clot
 - c. separation of fluids
 - d. dark blue-red color
10. Emergency action for a disconnected shunt is:
 - a. call the Doctor
 - b. place a clamp across each end of the tubes
 - c. wrap the shunt in a towel
 - d. try to reconnect the tubes
11. An advantage of the shunt is:
 - a. separation of the shunt is impossible
 - b. daily cleansing and redressing is unnecessary
 - c. no discomfort is caused by needle puncture
 - d. movement is unlimited in cannulated limb
12. An internal fistula is best described as:
 - a. two tubes (cannulae) placed in an artery and vein, which allow blood to flow from your body to the artificial kidney and back
 - b. an artificial connection of an artery and a vein which causes enlargement of the vein allowing entry of needles for dialysis.
 - c. a new method of dialysis treatment using an improved artificial kidney.
 - d. an outside passage which allows blood to mix with dialysate fluid.

POST-TEST

-3-

13. When you have a fistula you should avoid:
 - a. flexing of limb if fistula is near a joint
 - b. checking fistula for buzzing twice daily
 - c. washing fistula site with soap
 - d. looking for signs of infection
14. One of the most dangerous problems for a person who has a fistula is:
 - a. insect bites
 - b. loss of appetite and nausea
 - c. a blow or cut on the fistula arm or leg
 - d. gaining weight
15. Choose the incorrect action for care of fistula:
 - a. wash the fistula arm or leg whenever it becomes sweaty or dirty
 - b. wait to report soreness or tingling around fistula until you see the Doctor
 - c. use fistula arm or leg as you would normally
 - d. assume that the fistula is working when vibration or buzzing is present
16. Choose the correct action for care and protection of the fistula:
 - a. wear bands and tight clothing
 - b. keep fistula area clean
 - c. allow fistula area to become chilled
 - d. allow injections to be given in fistula limb
17. The two most important problems which affect a person who has a fistula are:
 - a. infection and clotting
 - b. sleeplessness and weakness
 - c. nausea and vomiting
 - d. loss of appetite and pain
18. Which of the following is not a sign of infection at the fistula site?
 - a. loss of buzzing
 - b. drainage of fluid
 - c. pain
 - d. redness
19. Which of the following are not signs of clotting of the fistula?
 - a. swelling and heat
 - b. pain and discomfort
 - c. redness and absence of buzzing
 - d. muscle aches and fever
20. A disadvantage of the fistula is that the fistula:
 - a. may come loose and cause hemorrhage
 - b. will cause limited arm or leg motion
 - c. requires the use of needles for each treatment
 - d. may clot frequently

PATIENT EDUCATION MODULE

LIVING WITH YOUR EXTERNAL SHUNT OR INTERNAL FISTULA

Answers for Pre-Test

- | | |
|-------|-------|
| 1. b | 11. b |
| 2. c | 12. a |
| 3. d | 13. d |
| 4. c | 14. b |
| 5. c | 15. d |
| 6. d | 16. a |
| 7. c | 17. c |
| 8. d | 18. b |
| 9. c | 19. a |
| 10. d | 20. b |

Answers for Post-Test

- | | |
|-------|-------|
| 1. c | 11. c |
| 2. a | 12. b |
| 3. a | 13. a |
| 4. b | 14. c |
| 5. b | 15. b |
| 6. a | 16. b |
| 7. d | 17. a |
| 8. b | 18. a |
| 9. a | 19. d |
| 10. b | 20. c |

APPENDIX F
DATA SUMMARY OF INDIVIDUAL PATIENTS

DATA SUMMARY OF INDIVIDUAL PATIENTS

SUBJECT	AGE	RACE	SEX	YEARS OF EDUC.	MONTHS ON DIALYSIS	SHUNT	TEACHING FISTULA	ANXIETY SCORE	LABORATORY VALUES CO ₂ K BUN CREAT	TEST SCORES PRE- POST-
1	55	W	F	12	30	N	Y	49	13 6.1 96 15.6	50 60
2	52	B	F	9	36	Y	Y	49	13 5.8 112 17.0	15 55
3	50	B	F	12	3	Y	Y	52	13 3.5 61 12.2	70 60
4	20	W	F	12	24	N	Y	52	14 4.7 115 17.1	75 100
5	24	W	F	12	60	N	Y	47	8 5.3 90 18.6	15 95
6	28	B	M	12	3	Y	N	54	11 4.5 100 17.4	75 80
7	42	W	M	10	60	Y	Y	55	10 4.8 107 17.4	75 90
8	45	W	M	13	54	N	Y	59	12 6.0 91 19.8	70 90
9	46	B	F	16	30	Y	Y	52	8 5.0 94 13.8	80 80
10	45	W	F	12	54	N	Y	55	17 4.9 66 18.0	75 75
11	44	B	F	12	30	N	Y	62	10 3.7 121 18.0	35 60
12	30	M	F	10	72	Y	Y	43	18 4.5 85 14.0	70 75
13	30	W	F	14	63	Y	Y	58	13 6.0 98 14.0	35 80
14	22	W	F	13	7	N	Y	44	16 4.0 57 12.8	80 90
15	47	B	M	12	30	N	Y	57	18 5.1 85 23.7	65 75
16	28	B	M	10	4	N	Y	54	16 4.8 56 13.4	50 80
17	43	B	M	11	36	Y	Y	61	13 5.3 119 21.6	75 65
18	55	W	M	12	4	N	Y	57	20 4.0 73 14.2	85 85
19	53	W	F	11	48	N	Y	48	10 5.9 101 15.0	75 80
20	47	W	F	12	18	N	Y	41	15 5.1 87 13.8	80 90
21	47	W	F	16	30	N	N	47	13 5.3 89 21.6	85 90
22	47	B	M	12	12	N	N	49	10 3.8 93 21.0	50 65
23	40	W	F	10	9	N	Y	61	13 3.5 61 15.0	65 60
24	51	W	F	12	36	Y	Y	56	18 5.1 75 14.6	65 90
25	30	W	M	12	27	Y	Y	48	13 3.3 58 20.1	70 75
26	50	W	M	14	11	N	N	68	16 2.9 67 17.7	70 85
27	40	W	M	16	9	N	N	64	12 4.8 101 17.7	85 100
28	45	W	F	16	5	Y	Y	42	5 3.0 68 7.7	80 100
29	46	W	M	14	2.5	N	N	49	20 4.8 57 9.2	75 95
30	23	W	F	14	24	Y	Y	50	22 3.1 69 13.8	95 90
31	35	B	F	9	8	N	N	48	3 1.8 31 8.7	40 60
32	56	B	M	10	72	N	N	37	13 3.5 68 19.0	45 75
33	56	W	F	12	1	N	N	43	21 4.8 55 7.2	30 50
34	33	W	M	12	9	N	Y	61	13 4.2 73 21.6	90 95
35	27	W	F	11	42	N	N	54	11 4.1 65 11.8	70 85
36	39	B	M	16	24	N	Y	63	18 6.1 91 20.4	90 85