Facilitators And Barriers To Initiation Of Hormone Replacement Therapy By Nephrology Health Care Providers

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FACILITATORS AND BARRIERS TO INITIATION OF HORMONE REPLACEMENT THERAPY BY NEPHROLOGY HEALTH CARE PROVIDERS

by

LYNN TRAMEL

A Thesis
Submitted in Partial Fulfillment of the Requirements for the Degree of Master of Science in Nursing in the Division of Nursing Mississippi University for Women

COLUMBUS, MISSISSIPPI

August 2001
Facilitators and Barriers to Initiation of Hormone Replacement Therapy by Nephrology Health Care Providers

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Abstract

Cardiovascular disease, osteoporosis, and dementia are three disease processes that have been directly linked to estrogen deficiency. Cardiovascular disease (CVD) is the number one cause of death for all postmenopausal women, including those with end-stage renal disease (ESRD). Osteoporosis and dementia are disease processes that profoundly affect the quality of life for postmenopausal women. Currently, 34% of women in the general population receive hormone replacement therapy (HRT), while only 10% of women with ESRD receive this therapy. Therefore, the purpose of this descriptive study was to examine the facilitators and barriers of nephrology health care providers to initiation of HRT among their postmenopausal patients. Pender’s Health Promotion Model was utilized for the theoretical framework. The research questions that guided the study were as follows: What are the barriers to nephrology health care providers initiating HRT on postmenopausal women with ESRD? And what are the facilitators to nephrology health care providers initiating HRT on postmenopausal women with ESRD? The
target population was nephrology health care providers at outpatient hemodialysis facilities. Tramel's Questionnaire was utilized to collect data. The convenience sample (N = 26) consisted of subjects who completed and returned the questionnaire for a 17% return. Descriptive statistics, including frequency distribution, percentage, and ranking, were utilized to analyze the data. Nephrology health care providers were 80.77% (n = 21) male and practiced nephrology for an average 12.8 years. The average number of postmenopausal women under their care was 138, and 42.31% (n = 11) reported prescribing HRT for these women. The number one ranked health facilitator to prescribing HRT was surgically-induced menopause. The need for more research in the area of HRT for women with renal failure was the number one ranked external facilitator. The number one ranked barrier to HRT initiation was a concern of physician liability. One implication for nursing is the need for continued research in the area of menopause for women with ESRD. Recommendations for further research included replication of this study with expanded geographical area and continued use of the research tool to establish reliability and validity.
Dedication

And whatsoever ye do in word or deed, do all in the name of the Lord Jesus, giving thanks to God and the Father by him. Colossians 3:17

I dedicate this thesis as well as my life and work to Jesus Christ, my Lord and Savior, for I know that it is His Will that I work with patients who have renal failure.

For I was an hungred, and ye gave me no meat: I was thirsty, and ye gave me no drink: I was a stranger, and ye took me not in: naked, and ye clothed me not: sick, and in prison, and ye visited me not. Then shall they also answer him, saying, Lord, when saw we thee an hungred, or athirst, or a stranger, or naked, or sick, or in prison, and did not minister unto thee? Then shall he answer them saying, Verily I say unto you, Inasmuch as ye did it not to one of the least of these, ye did it not to me. Matthew 25:42-45

Many dialysis patients are indigent; some have poor hygiene and very little clothing. Many rely on social services for transportation to and from hospitals and dialysis, doctor's appointments, the grocery store, and other personal business. Imagine having a stranger pick you up and take you home after a 2-week stay in the hospital. Often the only support they receive after getting home is a home health nurse (if they are lucky enough to qualify for this service) and one hot meal per
day from “Meals on Wheels”. For many dialysis patients the highlight of their week is coming to dialysis, for it may be the only socialization they receive; the only time someone touches them or speaks kindly to them. Being poor is a great trial in itself, as are the problems of living day to day with kidney failure. Coping with daily needs is enough, and often too much, without others looking down on you, especially health care providers. I became a nurse because I wanted to provide comfort and care for those in need. I vowed many years ago to care for my patients just as I would want my loved ones cared for.

We can and often do a lot of very good things to help others, but if there is no real caring for that person, then it is done to benefit ourselves in some way. Most people are like children; they know when you truly care and when you don’t. Romans 13:8 says our first responsibility is to love: “Owe no man anything, but to love one another . . .”

This thesis is also dedicated to someone very special to me, my brother, David. I love you very much.
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First and foremost, I want to acknowledge my family for their love and support during the last 3 years. I could not have finished this program without your help. To my soul mate and husband of 21 years, Terry, thank you for always being there to pick me up when I am down. God has truly blessed me with three wonderful children, Brandy, Casey Jo, and John Cole. Thank you for picking up the slack and for always helping me to see what is really important in this life. I am so proud of you all.

To my parents, Joe and Fran Brigance, and my brother and sister, Annette and David, thank you for all the encouragement you have given. To my father-in-law and mother-in-law, John and Marlyn Tramel, I am forever grateful for the love and concern you have always shown to me. I am thankful and blessed to have such a supportive extended family.

I would like to express gratitude to my research committee. There are some people whom we meet in this life and we know immediately they will forever impact us. Dr. Mary Pat Curtis, my advisor and research committee
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To my friend and niece, Dedria Mooneyham, for always coming to the rescue when I had another word processing crisis, I say thank you. To my friends, Daon Taylor, Debbie Harwell, and Judy McCormick. Thank you for your calls, love, and concern. Friends are truly a gift from God.

I have to acknowledge and thank some of the staff of North Mississippi Dialysis Services, even though some of you have moved on. You have been such a big part of my life for nearly 20 years, and we have made friendships
that will last a life time. Thank you Rhonda, Earnestine, Terry, Marsha, Pam, Sheila, Kim, Arnita, Connie, Terry, and Betty for your incitement and devotion. Thank you for always believing in me and being a friend to me.

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Chapter I
The Research Problem

A renewed interest in women’s health care issues over the past several years has facilitated research about menopause and the use of estrogen. Many clinical trials have confirmed the benefits of hormone replacement therapy to postmenopausal women. Some of these benefits included relief of menopausal symptoms, reduction in the risk of osteoporosis, maintenance of bone mass, improvement in lipid profiles and cognitive function, and reduction in the risk of cardiovascular morbidity and mortality (Holly, Schmidt, Bender, Dumler, & Schiff, 1997). In addition, recent studies have shown that the use of hormone replacement therapy (HRT) can prevent, lessen the severity of, or reverse dementia, particularly Alzheimer’s disease (Brinton, 1997).

Although the average age for women to be in a state of menopause has remained unchanged at 51.4 years, life expectancy has increased. By the year 2003, a woman can expect to live an average of 80 years; today women may live one third to one half of their lives past menopause.
in an estrogen deficient state (Lobo, 1999). Because of the benefits of HRT, its use in the general population has increased during the past 20 years. Currently, 34% of postmenopausal women in the United States are prescribed HRT. Within this population only 10% of postmenopausal women with end-stage renal disease (ESRD) receive a prescription for HRT from their health care provider even though the mean age for menopause is decreased to 47 years in these patients (Holly et al., 1997).

The population of postmenopausal women in the United States is climbing at an exponential rate. In 1990 there were 28.7 million women older than 55 years of age; by the year 2020 this group is estimated to be 45.9 million. In 1999 over 31 million women began the menopausal transition (Lobo, 1999). As the general population ages, the number of postmenopausal women with ESRD also will increase. The prevalence rate for ESRD among postmenopausal women was 607 per million in 1991 and had climbed to 931 per million in 1997 (Mattix & Singh, 2000). Cardiovascular disease (CVD), osteoporosis, and dementia are three disease processes that profoundly affect the quality of life and health of ESRD patients who are menopausal (D. Arnold, personal communication, May 14, 2001). Nephrology health care providers have ignored the issue of HRT in their postmenopausal patients despite mounting evidence that
estrogen therapy could possibly decrease morbidity and mortality and positively influence quality of life (Mattix & Singh, 2000). In an effort to better understand the disparity of HRT prescription in women with ESRD, this researcher explored the prescription practices of nephrology health care providers regarding initiation of HRT.

The American Association of Clinical Endocrinologist (AACE) has cited the following primary goals for HRT: relief of menopausal symptoms and prevention of cardiovascular disease, osteoporosis, and dementia. Some common menopause related symptoms that are relieved by HRT are hot flashes, decreased libido, depression, headache, insomnia, mood swings, nervousness, myalgia, and formications. Therapeutic levels of estrogen decrease the risk of cardiovascular disease, osteoporosis, and cognitive dysfunction (“Managing Menopause,” 2000). Sufficient data exist to suggest that all-cause mortality is decreased in women who take HRT, mainly because of the decrease in heart disease (Lobo, 1999). The AACE has recommended that all postmenopausal women consider HRT as preventive medicine (“Managing Menopause,” 2000). Existing research data and the AACE’s position are considered facilitating factors for initiating HRT for women by health care providers.
Cardiovascular disease is the number one cause of death in all postmenopausal women and the number one cause of morbidity and mortality in women with ESRD. "Cardiovascular disease in ESRD patients has reached epidemic proportions" (Mattix & Singh, 2000, p. 207). From 1995 to 1997 CVD accounted for more than 80% of deaths in ESRD patients over the age of 65 and 42% of all deaths in women age 45 to 64 years. The risk for CVD is increased threefold for women after menopause, thus menopause may be related to this high rate of death due to CVD in women with ESRD (Mattix & Singh, 2000). After menopause, women experience an accelerated rate of cardiovascular events, as well as a decrease in high-density lipoproteins (HDL) and an increase in low-density lipoproteins (LDL). Numerous studies have evaluated the effect of HRT on cardiovascular function. In 1997 Grodstein, Stampfer, and Coldita determined that after 15 years of estrogen replacement, risk of death by cardiovascular disease (CVD) was reduced by nearly 50%, and overall death was reduced by 40%. Some researchers credit these positive cardiovascular effects on the ability of estrogen to maintain lipoproteins at healthier levels through its interaction with proteins in the liver (Ginsburg et al., 1998). Other researchers believe that estrogen has a direct effect on blood vessels by reacting with receptors
on the vessel walls (Women's Health, 2000). Ginsburg et al. (1998) found that women with ESRD and coronary artery stenosis who received estrogen replacement at any time had a decrease in risk of death up to 27%.

HRT has been a preventative measure for the development of osteoporosis, a condition in which bones become thin, fragile, and fracture easily as a result of low bone mass. The decline in bone mass that occurs with estrogen deficiency is caused by osteoclastic activity (increased resorption) which becomes uncoupled from osteoblastic activity (bone formation). The deficiency also has an indirect effect on parathyroid hormone and cytokines, which oppose the resorptive effects. The positive effects of estrogen on growth factors, calcitonin, vitamin D metabolism, and calcium absorption also are diminished in estrogen deficient women (Lobo, 1999).

As a result of an estrogen deficiency, and at an annual cost of $10 billion, approximately 800,000 U.S. women fracture a vertebrae or hip, and an estimated 12% to 20% of these women do not survive the 6 months following the fracture. In a 1995 study, Lyhne and Pedersen evaluated the treatment of renal osteodystrophy in 23 dialysis patients. The researchers found that women demonstrated a significant decrease in bone mineral
content as compared to men. The bone mineral content decrease for females was 6% per year, but was insignificant for males in the study. Comparable findings in the general population have shown that bone mineral content decreases 1% per year in females 35 to 65 years of age and 2% per year in perimenopause (Lyhne & Pedersen, 1995). The significant difference in female bone mineral content suggests severe skeletal imbalances and could be related to sex hormone imbalances. The U.S. Food and Drug Administration (FDA) has approved the use of estrogen for the prevention of osteoporosis which currently is the most effective therapy for the prevention and treatment of osteoporosis (Women’s Health, 2000).

Although the life expectancy of women is greater than men, women suffer greater negative consequences of the aging process than men. One such consequence is dementia, particularly Alzheimer’s disease. In a 1996 study, Birge found that women were three times more likely to develop dementia than men, and women with CVD were five times more likely to develop dementia than women with no CVD. These data show that women have a higher risk for developing dementia than men and that a medical insult, such as myocardial infarction, stroke, or renal failure, may exacerbate dementia in women (Brinton, 1997).
Past authors on aging and dementia have shown that estrogen positively affects cognitive function; however, recent authors have produced evidence that estrogen delays the onset and progression of Alzheimer's disease. Five epidemiologic studies conducted from 1994 to 1996 demonstrated a 40% to 60% reduction in the risk of Alzheimer’s disease in women who had taken HRT (Hammond, 1999). Women treated with estrogen demonstrated a significant memory improvement and delay in cognitive loss. For example, in 1996 Tang et al. conducted a study of 1,124 women who were followed from 1 to 5 years. The study demonstrated that women who took estrogen for one year had a dramatic delay in the onset of Alzheimer’s disease. The researchers also determined that women who only briefly took HRT for menopausal symptom control experienced this delay in onset. Thus, it is speculated that even brief exposure to estrogen prevents irreversible loss of neurons and thereby influences the expression of Alzheimer’s disease (up to 30 years later). Recent studies have shown that estrogen stimulates the expression of neurotrophic factors, protects neurons from toxicity, stimulates axonal regeneration, and stimulates the production of acetylcholine and serotonin (Hammond, 1999).

Early studies on the reproductive function of female dialysis patients found the majority of these women to be
amenorrheic with no ovarian function. Results of studies conducted in the 1980s were that only 10% of premenopausal women had regular menses, but few studies have been done since 1987, when erythropoietin was introduced to the ESRD community. Erythropoietin is a hormone produced by the kidney to stimulate production of red blood cells; patients with ESRD were severely anemic prior to its introduction in 1987 (D. Arnold, personal correspondence, May 10, 2001). The etiology of ovarian failure is poorly understood but is thought to be hypothalamic in origin and possibly related to the elevated levels of prolactin associated with renal failure. In 1997, Holly et al. conducted a study of 76 premenopausal women receiving dialysis at four outpatient dialysis facilities in the United States. The researchers’ purpose was to identify menstrual patterns, contraception, HRT use, and sexuality issues. Women age 55 years and older when beginning dialysis were excluded from the study. Contrasted to earlier reports that only 10% of premenopausal dialysis patients menstruate regularly, Holley et al. found 42% (n = 32) of the subjects had regular periods. The sample (59%, n = 45) of women with ESRD also reported having irregular periods, and 64% (14 of 22) of the subjects reported heavy menstrual flow with clots. Of the sample
(N = 76), 19 were postmenopausal. Of these, 5 reported menopause occurring after starting dialysis.

In the same year, Cochrane and Regan (1997) undertook a prospective study to establish the nature and extent of gynecological disorders among 100 women with ESRD, including transplanted patients. The researchers found that of the 62 subjects who were menstruating, 81% (n = 50) had menorrhagia and 35% (n = 33) were amenorrheic. Of the 35 menopausal women in the study, 20% (n = 7) were less than 40 years of age and only 2 were on HRT. A total of 49 women enrolled in the study were less than 40 years of age; of these, 14% had primary ovarian failure. Prolactin levels in all subjects were normal except for those on hemodialysis which were elevated. The researchers concluded that 85% of these patients had menstrual disorders, mainly menorrhagia, which was of concern because heavy vaginal bleeding worsened the anemia of ESRD. Of the women identified as menopausal, all were recommended to initiate HRT. Cochrane and Regan determined that contraceptive counseling had been inappropriate or nonexistent and recommended all women with ESRD seek contraceptive counseling. Low-dose combined oral contraceptives were prescribed for most patients which had the added benefit of improved cyclic control. The eightfold increase in cervical dyskariosis among sample
women was thought to be related to the use of immunosuppressive drugs. Of significance is the fact that 80% of these abnormalities would have been missed had the researchers not preformed cervical smears on all patients. Cochrane and Regan (1997) confirmed the value of regular gynecological surveillance for seemingly asymptomatic women with chronic renal failure based on the unrecognized pathology identified in the study.

Hyperprolactinaemia is frequent in women with ESRD and associated with decreased oestadiol levels, decrease in sexual function, and depression. In 1999, Matuszkiewicz-Rowinska et al. documented the benefits of biweekly transdermal oestradiine in premenopausal estrogen deficient women on dialysis. The researchers concluded that normalization of oestradiol levels caused a fivefold reduction in prolactin/oestradiol ratio accompanied by an increase in general well-being, sexual function, libido, and physical activity (Matuszkiewicz-Rowinska et al., 1999).

The AACE, as well as other professional organizations, has recommended that all postmenopausal women consider HRT as preventive medicine. The primary contraindications to HRT are a history of breast or endometrial cancer, stroke, heart attack, liver disease, history of venous thrombosis, and undiagnosed vaginal
bleeding. Relative risks are smoking, hypertension, benign breast and uterine disease, endometriosis, pancreatitis, epilepsy, and headaches (Women’s Health, 2000). HRT is not without risks, including endometrial disease, breast cancer, vaginal bleeding, somatic complaints (breast tenderness), and idiosyncratic reactions, such as hypertension and venous thrombosis. These risks must be weighed against the potential benefits for each individual client on a case-by-case review (Lobo, 1999).

The documented benefits of HRT are numerous; however, the rate of HRT prescription remains low among women with renal failure. The purpose of this research, therefore, was to identify the facilitators and barriers to HRT prescription among these women. Possible barriers to health care providers prescribing HRT for women with ESRD include the perception that they are unlikely to benefit from HRT because of chronic illness and or shortened life span or because they may have a higher risk of adverse effects of estrogen (Andreoli, 2000). Factors such as physician attitude, ethnicity, secular trend, and geographic location also could explain the overall low rate of HRT among postmenopausal women with ESRD (Gillen, Gipson, & Stehman-Breen, 1999). Another barrier to consider might be physician’s lack of knowledge concerning HRT, such as dose and type to prescribe. Nephrologists are
specialists and may view HRT as primary care, and they opt not to prescribe for this reason. Further considerations of comorbid conditions, such as CVD, diabetes, peripheral vascular disease, and clotting disorders, also may be barriers to initiation of HRT in postmenopausal women on dialysis. Nephrologists are 95% male, which could be a barrier to initiation of HRT in itself, as they simply may never consider menopause or consider it outside their realm of practice. In addition, nephrologists may focus only on correction of medical problems relevant only to ESRD (D. Arnold, CFNP, personal communication, May 10, 2001). Facilitators to HRT initiation would include nephrology health care providers believing and practicing in health-promoting behaviors. Their beliefs about primary prevention and benefits to health-promoting behaviors will impact the way they practice. If they perceive HRT as having prophylactic uses, they will be more likely to prescribe.

**Significance to Nursing**

The documented benefits of HRT may have significance for postmenopausal women with ESRD. The younger age for entering menopause in this population of patients removes the protective cardiovascular, cognitive, and bone mass effects of estrogen. Women with ESRD have a higher risk
for cognitive dysfunction, renal osteodystrophy, accelerated atherosclerosis, and cardiovascular disease compared to the general population. Cardiovascular disease accounts for nearly half of the mortality in dialysis patients each year. The potential benefits of HRT for women with ESRD are numerous. The cardiovascular protective effects alone could significantly decrease related morbidity and mortality, as well as a substantial decrease in associated health care costs (Gipson, 1999).

Nephrology health care providers are in a unique position to initiate HRT as dialysis patients are seen by physicians and nurse practitioners on a weekly basis. By viewing HRT as preventive medicine, these health care providers could dramatically impact related morbidity and mortality in postmenopausal women with ESRD, as well as improve their quality of life by decreasing depression and enhancing mood. Nurse practitioners are educated to assess and treat women holistically. The nephrology nurse practitioner could augment the care of these women not only in the area of HRT, but also in the areas of teaching, counseling, and prevention, as well as assessment and treatment.
Theoretical Framework

Pender's Health Promotion Model was used as the theoretical framework for this study (1987). The Health Promotion Model contains concepts relevant to health-promoting behaviors with the goal of nursing to support the achievement of optimal health for each person. Pender identified behaviors and mechanisms for enhancing health called cognitive-perceptual factors. These factors include importance, control of, definition, and perceived status of health. In addition, self-efficacy and perceived benefits and barriers to health-promoting behaviors are factors that directly impact health-influencing behaviors. Rather than let disease happen when it is avoidable, Pender emphasized disease prevention. When health promotion and prevention fail to prevent disease, the priority then shifts from primary to secondary and tertiary care (Pender, 1987). Often an acute illness turns into a chronic, devastating disease that could have been prevented by early utilization of health promotion and disease prevention concepts.

The purpose of this study was to identify the facilitators and barriers to nephrology health care providers initiating HRT in postmenopausal women with ESRD. Researchers have established that HRT initiation in postmenopausal women can prevent CVD, osteoporosis, and
dementia as well as numerous other benefits. Therefore, Pender’s Health Promotion Model was utilized as a guide to investigate the health-promoting behavior for initiating HRT among postmenopausal women with ESRD for health care providers. The beliefs of nephrology health care providers about primary prevention, importance of health, and perceived benefits to health-promoting behaviors are concepts from the Health Promotion Model that are applicable to this study.

Nurse practitioners and nephrologists working with ESRD must buy into the perceived benefits of HRT. Endorsing this concept could make them more apt to refer, teach, counsel, and assess their postmenopausal patients for signs of estrogen deficiency. Another concept in the Health Promotion Model is importance of health; if health care providers recognize HRT as important to health, they could be more apt to prescribe. If they support the benefits of HRT, this is a facilitator; if they do not, it is a barrier.

In Pender’s revised Health Promotion Model (1996), the term *immediate competing demands and preferences* replaced the concepts of benefits and barriers. Competing demands refer to conflicts over which the individual (health care provider) has low control. Chronic illness and comorbidity associated illness of ESRD patients might
be competing demands for the initiation of HRT in this population of patients. Breast cancer or preexisting cardiovascular disease are contraindications to the initiation of HRT and would therefore be considered a competing demand (barrier). Behaviors with high personal control refers to preferences (facilitator). A preference in this study would be the health care provider’s belief that HRT has prophylactic uses, such as prevention of CVD, osteoporosis, and dementia (Pender, 1996).

Pender ascertains that health promotion and disease prevention should be the primary focus in health care. The current researcher agrees and considers HRT as a health promotion and disease prevention strategy for postmenopausal women with ESRD. In addition to reduced morbidity and mortality, initiation of HRT to women on dialysis may significantly improve their quality of life by decreased menopausal symptoms, increased libido and sexual function, improved physical activity, and an enhanced sense of well-being. These are factors that are considered to be health-enhancing (Tomey & Alligood, 1998).

Assumptions

The assumptions of the study were as follows:
1. Estrogen replacement is the most effective therapy against osteoporosis.

2. HRT plays a role in decreasing the cardiovascular related mortality of postmenopausal women.

3. Women who are postmenopausal and have ESRD would benefit from HRT.

4. Nephrology health care providers can describe their prescribing practices of HRT.

5. Health-promoting behaviors among nephrology health care providers are influenced by competing demands and preferences.

Statement of the Problem

Currently, only 10% of postmenopausal women with ESRD are prescribed HRT, while 34% of women in the general population are prescribed HRT. As HRT may contribute to the reduction of morbidity and mortality in patients with ESRD, the barriers and facilitators to nephrology health care providers initiating HRT should be addressed. Therefore, this researcher focused on the facilitators and barriers to the initiation of HRT in postmenopausal women with ESRD by nephrology health care providers.

Research Questions

This study addressed the following research questions:
1. What are the barriers cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

2. What are the facilitators cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

Definition of Terms

For the purpose of this study, the following terms were defined for clarity of application:

1. **Barriers**: Theoretical: factors which obstruct or impede. Operational: factors which obstruct or impede nephrology health care providers from initiating HRT in postmenopausal women with end-stage renal disease as identified on Tramel’s Questionnaire.


3. **Hormone replacement therapy**: Theoretical: daily replacement of conjugated estrogen and or medroxyprogesterone acetate (MPA) to alleviate symptoms of menopause or as prophylaxis for disease prevention.
Operational: daily replacement of conjugated estrogen and or medroxyprogesterone acetate (MPA) to alleviate symptoms of menopause and prophylaxis for disease prevention as identified on Tramel’s Questionnaire.

4. Postmenopausal women: Theoretical: females who have experienced cessation of menses for more than 12 months. Operational: females who have experienced cessation of menses for more than 12 months and have ESRD.

5. End-stage renal disease: Theoretical: a progressive, irreversible renal function deterioration in which the body's ability to maintain metabolic and fluid and electrolyte balance fails, resulting in uremia, and requiring dialysis or renal transplantation. Operational: a progressive, irreversible renal function deterioration which requires dialysis or renal transplantation. This deteriorated disease must have been diagnosed in females for more than 6 months.

6. Facilitator: Theoretical: a factor that makes a task easier. Operational: a factor which would make it easier for nephrology health care providers to initiate HRT in postmenopausal women with ESRD as identified on Tramel’s Questionnaire.
Summary

The purpose of this study was to identify facilitators and barriers to HRT of postmenopausal women with end-stage renal disease. Recent studies have shown that HRT is under-prescribed in this population of patients. Estrogen deficiency predisposes women to serious health problems while estrogen replacement therapy can prevent or postpone major health problems, such as Alzheimer’s disease, osteoporosis, and cardiovascular disease. There is a need for more research in the areas of menopause, estrogen deficiency, and hormone replacement in women with end-stage renal disease (ESRD).

Chapter II will provide a review of literature. Chapter III will describe methodology used for this study.
Chapter II
Review of the Literature

Studies specifically addressing hormone replacement therapy (HRT) in women with end-stage renal disease (ESRD) have been limited. Studies available for substantiating the need for this research, relaying expertise on the subject, and providing conclusions for guiding the direction of this research are presented in this chapter. Established researchers reviewed were focused on concerns with potential cardiovascular and bone sparing effects of HRT as well as gynecological issues of women with ESRD.

Hyperprolactinaemia is common among women with ESRD and is associated with decreased oestadiol levels, decrease in sexual function, and depression. Matuszkiewica-Rowinska et al. (1999) conducted a study in Warsaw, Poland, to document the benefits of HRT in premenopausal women on hemodialysis with oestrogen deficiency. The aim of the study was to evaluate the effect of HRT on sexual function, serum 17B-oestradiol and prolactin levels, and bone mineral density.
The researchers enrolled 23 women for this 12-month study; subjects were divided into two groups. Group I consisted of 13 women and was the treatment group. They received biweekly transdermal oestradiine with cyclic addition of norestisterone acetate (Estracomb TTS 50/0.25; Norvartis). Group II was the control group and consisted of 10 women who received no treatment. Entry criteria included the following: secondary amenorrhea, serum 17B-oestradiol concentration < 30 pg/ml, and on hemodialysis at least 6 months. A serum PTH > 400 pg/ml, treatment in prior 3 months with Vitamin D analogues, and immobilization or corticosteroid therapy for the previous 12 months were exclusion criteria. In addition, diffuse fibrocystic disease of the breast, endometrial hypertrophy, and treatment with sex hormones for the previous 5 years excluded subjects. The etiology of renal failure for all subjects were glomeruli and interstitial nephritis, polycystic kidney disease, diabetic nephropathy, and other renal causes. These were distributed equally in both groups.

All subjects received baseline mammography and endometrium biopsy. In addition, serum17B-oestradiol (normal range for follicular phase = 25-75 pg/ml), and prolactin (normal range = 66-490 mlU/ml) levels were drawn at baseline and 1, 3, 6, and 12 months in Group I, and
before and after the study in Group II. Pre-dialysis serum
(calcium, alkaline phosphate, and routine biochemistries
were assayed every 3 months, and serum triglycerides, LDL,
and HDL every 6 months. Intact PTH levels and bone mineral
density of the lumbar spine (L2-L4), femoral neck, and one
third distal radius were measured in all subjects before
and after the study. In addition, every 3 months all
subjects received a general physical and gynecological
examination as well as an interview. They were asked to
rate themselves on questions concerning libido, sexual
activity, physical fitness, appetite, mood, self respect,
and general well-being. Statistics were calculated
utilizing student t tests for paired samples, with p < .05
taken as significant, and values were expressed as mean ±
SD.

Matuszkiewicz-Rowinska et al. (1999) found after 1
month of treatment an increase in 17B-oestradiol from
20.47 ± 11.69 pg/ml to 46.8 ± 13.6 pg/ml (p < .001) for
Group I. Also, of significance was a progressive reduction
of serum prolactin concentration from 1457 ± 1045 to 691 ±
116 mIU/ml after 12 months of treatment with oestrogen-
progestin therapy. Thus, the prolactin/oestradiol ratio
decreased from 71.0 to 13.7 (p < .001). There was no
change in PTH, alkaline phosphate, calcium, hematocrit,
routine biochemistries, or blood pressure readings. The
only change in lipid profile was a moderate increase in mean serum HDL-cholesterol ($p < .01$) in the treatment group. In both groups, the baseline bone mineral density $z$ scores were depressed, with the lowest areas found at the lumbar spine. In Group I, an increase in bone mineral density at all three sites was noted with significant increases at L2-L4 ($p < .05$). The other two site increases were not significant. Control Group II experienced a mild, insignificant decrease in bone mineral density. The bone mineral density comparison of both groups after 12 months revealed marked differences in all three sites: distal radius ($p < .01$), femoral neck ($p < .02$), and L2-L4 ($p < .05$). The researchers concluded that normalization of serum oestradiol levels in women with previous oestradiol deficiency is sufficient to prevent bone loss and increase bone formation.

In addition, Matuszkiewicz-Rowinska et al. (1999) discovered a substantial improvement in sexual function in Group I compared to Group II. All of the women in Group I experienced regular menses, two women in the control group experienced a resumption in menstruation, but had irregular cycles. Also in the treatment group, 11 out of 13 women reported a marked increase in libido, and 6 out of 8 women who were in stable relationships either resumed sexual intercourse or had a substantial increase in their
sexual activity. These women also reported an increase in physical well-being, activity, mood, mental alertness, and self-respect.

The researchers concluded that normalization of oestradiol levels in premenopausal women on hemodialysis caused a fivefold reduction in prolactin/oestradiol ratio. These changes were accompanied by an improvement in general well-being, restoration of regular menses, and a marked improvement in sexual function. Also, of significance was an increase in bone mass with inhibition of bone demineralization. The researchers suggested that oestrogen deficiency has an important role in ureamic bone disease in premenopausal, amenorrheic women on dialysis.

The long survival rate of ESRD patients has caused an increased prevalence of complications that can strongly influence their quality of life. Hyperprolactinaemia is frequent in these patients and associated with a decreased oestradiol level and a decrease in sexual function. Depression also is frequent in this population of patients. Decreased oestradiol levels and sexual dysfunction may contribute to this depression as well as decrease the perceived quality of care. This current researcher finds Matuszkiewicz-Rowinska et al.’s study applicable to the current research because their results demonstrate that HRT increases general well-being,
physical activity, libido, and sexual function. These factors have a significant role in the quality of life of these patients.

Of particular interest to the current researcher was the high mortality rate related to cardiovascular disease in women with ESRD. Therefore, studies exploring this topic were reviewed.

Ginsburg et al. (1998) conducted a study at Brigham and Women’s Hospital in Boston. The researchers hypothesized that estrogen replacement therapy will improve lipoproteins in postmenopausal women with ESRD. The purpose of the study was to examine the effects of estrogen therapy on lipoproteins.

Included in the study were women > 45 years old who had been on hemodialysis > 6 months. Additional criteria included hematocrit > 22%, normal hepatic transaminase, and a follicle stimulating hormone > 40 IU/ml. History of previous CVA, breast cancer, and current diabetes mellitus requiring insulin were exclusion criteria. Of the 11 subjects who completed the study, the mean age was 61.4 + 2.7 years, 8 were African American, 1 was Hispanic, and 2 were White. Two subjects had noninsulin-dependent diabetes mellitus. No subject received any estrogen replacement therapy for 6 weeks prior to the study.
Because of concerns of excess sex hormone levels, a desire to minimize patient risk and the need to assess lower dose estrogen replacement therapy, seven subjects entered a pilot study to evaluate estradiol levels attained on 1 mg oral estradiol daily for 4 weeks. Based on the results of this pilot study, 13 subjects entered a double-blind crossover study using oral micronized estradiol 2 mg and a placebo. The subjects were randomized to receive either the placebo or estrogen daily for 8 weeks. After a 4-week washout period, subjects received the other therapy for 8 weeks. After completing the 8 weeks of placebo estrogen, all subjects took medroxyprogesterone acetate 10 mg daily for 1 week.

Fasting blood samples were drawn at the initiation of the hemodialysis treatment at three different times in the study. The first was baseline or pre-intervention, then, 2 days during the fourth week of intervention, and lastly, 3 days during the last week of intervention. The results from each week were averaged and analyzed at the Lipid Research Lab of the Nutrition Department at Harvard School of Public Health. The following blood tests were done: total cholesterol, HDL, HDL2, HDL3, LDL, triglycerides, estradiol, VLDL (including apolipoprotein A1) estradiol, estrone, albumin, and sex hormone binding globulin (SHBG).
The pilot study group who took estradiol 1 mg daily for 4 weeks was compared to the group taking 2 mg per day. Comparisons were considered statistically significant at \( p < .05 \). The estradiol levels in the 1-mg group increased from 21 ± 6 to 91 ± 19 (\( p = .024 \)). In comparison to the placebo group, statistically significant increases in estradiol, estrone, and SHBG were achieved. Total HDL increased in all groups (1 mg estradiol, 2 mg estradiol, and placebo), the mean values were 16.1%. Total HDL concentration increased from 52.2 ± 19.4 mg/dl after placebo treatment to 60.6 ± 19.6 mg/dl (\( p = .046 \)). HDL3 increased by only 9.2% and was not statistically significant. LDL cholesterol was unchanged for all groups. Apolipoprotein A1 increased by 24% (\( p = .0002 \)), and total tryglycerides increased by 15.8% with daily estradiol. However, compared to the placebo group, neither was statistically significant.

Ginsberg et al. (1998) found that oral estradiol increases total HDL by an average of 8.4 mg/dl (16.1) and apolipoprotein A1 by 24.6% compared with the placebo group. Previous studies in patients with no renal failure have suggested that comparable increases in HDL are expected to decrease the risk of cardiovascular disease by 50%. The 1-mg dose of estradiol for 4 weeks increased HDL by 20%, which also is a level of response that would be
expected to decrease cardiac morbidity and mortality. The researchers advocated the use of 1-mg estradiol dose for future trials to minimize the risks associated with higher hormone levels.

Many treatments for hyperlipidemia in the ESRD population have been evaluated, including gemfibrozil, probucol, lovastatin, and simvastatin. Many of these lipid-lowering agents have major side effects, such as rhabdomyolysis and elevated hepatic transaminases. The researchers concluded that similar benefit from estrogen replacement therapy may be achieved with fewer side effects.

Ginsburg et al. (1998) did not address the question of whether improvements in lipoprotein parameters could lead to comparable reductions in cardiac mortality. Larger clinical trials are needed to determine if estrogen replacement therapy should be routinely prescribed for postmenopausal women with ESRD. The current researcher finds this study applicable to her effort because the benefits of estrogen replacement therapy have been clearly demonstrated to reduce the risk of cardiovascular mortality in postmenopausal women with normal renal function. Because of the high mortality rate associated with postmenopausal women with ESRD, estrogen therapy should be considered for these patients. However, this
possible benefit must be weighed against side effects of estrogen replacement therapy, such as venous thromboembolism, cholelithiasis, and increased risk of breast cancer.

The current researcher sought studies which identified reproductive and or genealogical issues in patients with ESRD. In a study which focused on gynecological disorders in women with renal failure, Cochrane and Regan (1997) undertook a prospective study which aimed to establish the nature and extent of gynecological disorders among 100 women with CRF (chronic renal failure) and or who had received a renal transplant.

Subjects were referred to the gynecology clinic by the nephrologists. They completed a detailed questionnaire concerning their renal disease, treatment, and gynecological history. They also underwent a pelvic exam and ultrasound, cervical smear, and serum FSH, LH, oestradiol, and prolactin levels. Women 50 and older had a mammogram. Of the sample (N = 100), 44 had a functioning renal transplant (mean age 39.6 years), 30 were managed by drug therapy (mean age 35.9), 17 were on hemodialysis (mean age 43.6), and the other 9 were on peritoneal dialysis (mean age 42.4). Nearly 40% of the women were referred for menstrual disorders, 12% for menopausal symptoms, 13% for subfertility, 11% for contraceptive
counseling, and 2% for abnormal cervical smears. Only 23% of these subjects were referred for screening and surveillance.

The researchers found that of the 62 women who were menstruating, 81% had menorrhagia and 35% were amenorrheic. Of the 33 women with amenorrhea, 30 were menopausal. Only 12% of the 100 women had a normal menstrual cycle. Twelve women were referred with a diagnosis of menopause, but after examination of all subjects, the researchers discovered 23 women who were menopausal. Of these women (n = 35), 20% were less than 40 years old, and only two were on HRT. A total of 49 women were enrolled in the study who were less than 40 years of age; of these, 14% had primary ovarian failure.

Cochrane and Regan (1997) found 53 of the 100 women required contraception; 13 of these had never had contraceptive counseling. An intrauterine device was found in 5 patients, which is not recommended for these patients as it may exacerbate menorrhagia and increase the risk of infection in immunosuppressed women. There also were 24 women identified who could potentially become pregnant; of these, 92% had involuntary infertility.

Only 2 women were originally referred for an abnormal cervical smear. After initial examination of all subjects, 8 more were identified to have an abnormal cervical smear.
Of these women, 4 were diagnosed by colposcopy with cervical intraepithelial neoplasia (CIN), and 1 was found to have invasive cervical carcinoma and underwent hysterectomy.

Prolactin levels in all subjects were normal except for those on hemodialysis, which were elevated. The researchers concluded that 85% of these patients had menstrual disorders, mainly menorrhagia, which was of concern because heavy vaginal bleeding worsens the anemia of CRF and may necessitate blood transfusion. Transfusions are undesirable as they cause atypical and cytotoxic antibodies which decreases the chance of successful organ matching. Also, treatment with erythropoetin is expensive and may be withheld in women with persistent menorrhagia. For treatment of menorrhagia, the researchers supported the use of high-dose medroxyprogesterone acetate (Provera).

Cochrane and Regan (1997) concluded that menstrual disorders were not reduced after renal transplantation, and approximately 33 subjects were amenorrheic. This menstrual disorder was not perceived to be a problem by the nephrologists. Of the 35 women identified as menopausal, all were recommended and encouraged to initiate HRT. The researchers cited these patients to be at high risk for osteoporosis because of the cumulative
effects of ovarial failure, long-term steroid therapy, and CRF. Cochrane and Regan also found that contraceptive counseling had been inappropriate or nonexistent, and they recommended all women with CRF seek contraceptive counseling. Low-dose combined oral contraceptives were recommended for most patients and had the added benefit of improved cyclic control. Severe hypertension and active systemic lupus were cited as contraindications to oral contraceptive. The researchers also identified an eightfold increase in cervical dyskariosis and related this to the use of immunosuppressive drugs. Of significance is the fact that 80% of these abnormalities would have been missed had the researchers not preformed cervical smears on all patients. Therefore, these researchers recommended that women with CRF on immunosuppressive therapy undergo annual cervical screening.

Cochrane and Regan (1997) confirmed the value of regular gynecological surveillance for seemingly asymptomatic women with chronic renal failure based on the unrecognized pathology identified in the study. This current researcher finds this study applicable to her study because of the high incidence of undetected gynecological disorders in this population of patients.
These disorders could potentially complicate and aggravate the management of renal disease.

Of interest to the researcher were patient profiles of current HRT use. Therefore, studies that included demographic and clinical data of patients who were prescribed HRT were reviewed.

In 1999, Gillen, Gipson, and Stehman-Breen conducted a secondary analysis of data from the United States Renal Data Systems (USRDS) Dialysis Morbidity and Mortality Study (DMMS) Wave 2. They sought to assess the prevalence and predictors of HRT in postmenopausal women with ESRD.

The DMMS had detailed demographic, behavioral, and medical history of patients with ESRD. This prospective study included a random sample of patients from 25% of the dialysis facilities in the United States that opened after January 1, 1994. The subjects were at least 18 years of age, had been on dialysis for more than 90 days, and qualified for Medicare. Subjects who were previously transplanted and or were on home dialysis were excluded from the study. Data were collected by dialysis facility personnel. Patient demographic and behavior data obtained were gender, age, race, weight, height, marital, employment, and educational status. Clinical data included medications, co-morbid conditions, and exercise frequency.
Of the DMMS sample, Gillen et al. selected 1,499 subjects for the secondary analysis. All females age 45 and older were considered postmenopausal and included in the study. From the medication list, the use of estrogen, progesterone, or a combination was determined for each subject. The use of HRT among the subjects was predicted, utilizing logistic regression to estimate the independent contribution of demographic, behavioral, and medical history variables. The odds ratios were interpretable as the adjusted odds of being prescribed HRT for each variable of interest. Confidence intervals were established using the estimated standard error of the coefficient (B1) from the logistic regression analysis. The relationship between HRT and triglycerides and cholesterol were estimated using linear regression and reported as the mean difference in triglyceride or cholesterol between subjects who used HRT and those who did not, along with 95% confidence intervals. SPSS statistical software was used to analyze the data.

Gillen et al. (1999) determined the prevalence of HRT prescription among the subjects was 10.8% (162 out of 1,499). Prescription prevalence was highest in the fifth decade of life (18%) and lowest in the eighth decade (7%). Women in their 40s received HRT 15% of the time, while those in their 60s and 70s had a prevalence of 8%.
Ninety-five percent of the subjects were prescribed estrogen and or progesterone separately, whereas the remaining subjects (n = 8) were prescribed a combination preparation. For each decade of life, subjects were 26% less likely to be prescribed HRT. This was compared to a previous study which cited HRT use in the general population which was 34%.

The researchers determined predictors of HRT use among the subjects, including age, ethnicity, education, and ambulation status. All predictions were made after adjusting for education, race, and independent ambulation. Black subjects were 50% less likely to be prescribed, HRT than white subjects (aOR=0.50, \( p < .002 \)). Subjects with a college degree were threefold more likely to be prescribed HRT than those with a high school degree or less (aOR=2.98, \( p < .001 \)). Ambulatory women were nearly twofold more likely to be prescribed HRT than those who were not ambulatory (aOR=1.99, \( p = .05 \)). In addition, subjects with diabetes were less likely to be prescribed HRT than nondiabetics (OR=0.65, \( p < .01 \)). Cholesterol levels were 11.0 mg/dl (95% CI, 1.5 to 20.5) higher in subjects prescribed HRT compared to women not on HRT. Triglyceride levels were 47.2 mg/dl (95% CI, 18.9 to 75.5) points higher in women using HRT.
Gillen et al. (1999) cited factors which might explain the overall low rate of HRT prescription in postmenopausal women with ESRD, including physician attitude, ethnicity, secular trends, and geographic location. Also, variation in demographic distribution between women with and without ESRD could account for much of the difference in the rate of HRT prescription.

The researchers concluded that HRT use in the general population is greater than in women with ESRD. The most important predictors of HRT prescription in postmenopausal women with ESRD were younger age, higher education, White race, and ambulatory status. The current researcher finds this study applicable to her study and agrees with the researchers that targeting groups of women who are likely to benefit from, but least likely to be prescribed, HRT could increase the prescriptions of HRT in this population.

A study of women with ESRD to identify menstrual patterns, contraception, HRT use, and sexuality issues was conducted by Holley, Schmidt, Bender, Dulmer, and Schiff (1997). The sample was 191 women receiving hemodialysis at four dialysis facilities in the United States. Inclusion criterion was women less than 55 years old when they began dialysis. Medications were reviewed for estrogen replacement only. Women less than 55 years of age
completed the questionnaire (N = 76), and their responses formed the data for the study. Women older than 55 were excluded from the study (n = 115) and only completed part of the questionnaire. The demographic data on the questionnaire included age, race, mode of dialysis, age at start of and time on dialysis, and use of recombinant erythropoietin. Also included on the survey were questions concerning pregnancies, menstrual cycle, sexual activity, use of birth control pills and HRT, and questions concerning preventative health care. Of these subjects, 52 were on hemodialysis, and 24 were on peritoneal dialysis.

Statistical analysis utilized the chi-square test for comparison of proportions. In addition, the Mann-Whitney U test and student t test were used when appropriate. Data were represented as mean values ± standard deviation or medians, and p < .05 was considered significant.

Of the 76 subjects in the study group, 70% (n = 53) had been pregnant at least once; 4 (2%) of the pregnancies occurred after dialysis was initiated. Of the 4 subjects who became pregnant while on dialysis, only 2 reported birth control discussions by their nephrologists or primary health care provider, and 1 continued to be sexually active without using birth control. The response of subjects on hemodialysis (n = 52) and peritoneal dialysis (n = 24) were summed and analyzed together as
there was no significant difference in the responses between groups. Holley et al. found that 32 of the subjects were currently menstruating; of those, 59% ($n = 19$) reported irregular menses. The sample reported heavy flow with clots when compared with flow before starting dialysis (14 of 22 [64%] vs. 18 of 48 [38%]: $p = .05$). Of the study subjects, 19 ($n = 28$) were postmenopausal; of these, 5 reported menopause occurring after starting dialysis. Although the median age of the subjects was 43, only 50% reported being sexually active; postmenopausal women were less likely to be sexually active (4 of 17 vs. 30 of 49; $p = .01$). Of these sexually active women, 36% ($n = 27$) reported using birth control. Only 13% ($n = 9$) reported discussing birth control options with their nephrologists. Of the sample, 63% ($n = 47$) had yearly papanicolaous smear, and 73% ($n = 50$) had a mammogram.

Of the study subjects, 19 (28%) were postmenopausal; 53% ($n = 10$) reported experiencing menopause naturally. Only one of the postmenopausal women received estrogen replacement therapy, the remainder either did not answer the question or were not using any form of HRT. Of the 20 subjects who did not answer the question concerning HRT (24 of 44), Holley et al. determined through a review of the medication list that 5% were on estrogen replacement
therapy. Of 113 subjects 55 and older, only 5% were receiving estrogen replacement therapy.

Holley et al. (1997) concluded that 42% (n = 32) of the subjects were currently menstruating, which contrasts with earlier researchers who determined 10% of premenopausal women on dialysis had regular menses. Holley et al. established that the use of recombinant erythropoietin contributes to the significant increase in menses in these subjects. Uremic women have an acyclic pattern of gonadotropin release because of impaired estradiol stimulation, which possibly is related to hyperprolactinemia. In addition, high prolactin levels were postulated to be contributory to decreased libido and lower frequency of sexual intercourse among females with ESRD. The researchers also concluded that some features of contemporary dialysis care, such as the use of recombinant erythropoietin with improved hematocrits and adequacy of dialysis, may be related to reduced prolactin levels.

The current researcher finds the overall low rate of hormone prescription in Holley et al.'s sample of postmenopausal women is a concept of this current study. Also, of particular interest was the low incidence of counseling to premenopausal women by their nephrologists or primary health care provider. Holley et al. recommended
further study to validate their findings and determine why the rates of HRT were so low.

Lyhne and Pedersen (1995) conducted a 2-year prospective study of 23 dialysis patients at Odense University Hospital in Denmark. The purpose of the study was to evaluate the medical treatment of renal osteodystrophy, a condition found frequently in patients with ESRD. The subjects included 12 women and 11 men. Median age for females was 54 (range 27 to 68) and 60 for men (range 24 to 68). Inclusion criteria were initiation of dialysis between 1985 and 1990, peritoneal dialysis as first mode of dialysis, and less than a 2-month interruption in treatment. Exclusion criteria were previous use of steroids, oestrogen in any form, or hormonal contraceptives. The cause of renal failure was equally distributed between male and female subjects and primarily included glomerulonephritis, diabetic nephropathy, and polycystic kidney disease.

At baseline and every 6 months during the study, bone mineral content was measured by single photon absorptiometry at the fixed radius of the dominant forearm. The mean value was calculated by the average of four 2-dimensional scans. This method has an accuracy of 0.958 (the coefficient of correlation between bone mineral content and bone calcium content) and 0.8 - 1.4%
reproducibility. In addition, serum 1,25 (OH) 2 D3 levels were measured at the beginning of the study and every 6 months. Baseline and monthly serum total calcium, albumin, phosphate, total alkaline phosphate, and bicarbonate levels were also measured (Lyhne & Pedersen, 1995).

Daily treatment modality included four dialysis exchanges per day, using Ca++ 3.5 mEq/L dialysate bags, oral phosphate binder, and oral Vitamin D3 (1-alpha-OH-D3) supplementation. The median dose of Vitamin D3 over the 24-month study period was 0.25 for both males and females. The mg/kg median dose of phosphate binder for both genders during the study was 12. Serum 1,25 (OH) 2D3 levels and bone mineral content were not taken into account when prescribing doses.

Lyhne and Pedersen (1995) utilized Wilcoxon's test of paired data and Mann-Whitney's test of unpaired data to evaluate results. Ranges or medians were used to describe results, with calculations of the p and 95% confidence limits of the median. Kendall's rank test was used for correlation tests. The bone mineral content was expressed in percentage of the initial value.

The researchers determined that the bone mineral content significantly decreased (p < .001) for female subjects over the 24-month study period when compared to male subjects. The median decrease of bone mineral content
for females was 12% over 2 years, but was nonsignificant for males subjects ($p < .01$). No significant correlation emerged between age and bone mineral content change in either group (Kendall’s $T = 0.182$ and $0.067$, respectively). (Comparative findings in the general population has shown bone mineral content decreases of 1% per year in females ages 35 to 65 years and a 2% decrease during perimenopause.) The researchers found no significant difference in oral vitamin D3 dose or serum D3 levels in either group. Female subjects demonstrated a significant increase in serum Ca++ ($p < .05$), as well as a decrease in serum phosphate ($p < .05$), while male subjects showed no significant change in either. However, there was a significant decrease in serum albumin and body weight in the male group ($p < .01$ and $p < .05$, respectively), but only slight decreases in the serum albumin and maintenance of body weights (100% of weight at start vs. 105% at 24 months) in the female group.

Lynne and Pedersen (1995) concluded that the women who had peritoneal dialysis as first mode demonstrated a significant decrease in bone mineral content as compared to men, even though lab values and maintenance of body weight demonstrated better treatment outcomes in the female groups. The researchers also concluded that this significant decrease compared to the general population
suggest severe skeletal imbalances in the female subject group which could indicate a sex hormone-related disturbance.

Summary

There were no empirical studies in the review of literature that specifically identified barriers and facilitators to HRT initiation; however, there were numerous studies that cited the benefits to correction of estrogen deficiency among postmenopausal women with renal failure.

Several previous studies have examined reproductive and sexuality issues among women with renal failure. Matuszkiewicz-Rowinska et al. (1999) conducted a study of 23 postmenopausal women with renal failure to evaluate the effect of HRT on sexual function, estrogen and prolactin levels, and bone mineral density. The researchers concluded that normalization of estradiol levels in these women with previous oestradiol deficiency is sufficient to prevent bone loss, increase bone formation, and improve libido. Cochrane and Regan (1997) undertook a prospective study which aimed to establish the nature and extent of gynecological disorders among 100 women with ESRD and or who had received a renal transplant. The researchers found that reproductive problems were frequent and unrecognized
and menopausal symptoms were undertreated. Of the subjects, 58% had a menstrual disorder, with uncontrolled menorrhagia being a significant problem and 45% were found to be postmenopausal. The researchers determined that 80% of the abnormalities identified would have been missed had they not performed cervical smears on all patients. In another study of women receiving dialysis, Holley et al. (1997) identified sexuality issues, menstrual patterns, contraception, and HRT use. The researchers reported the median age for menopause was 47 years, and only one postmenopausal woman received HRT.

The study conducted by Lyhne and Pedersen (1995) to evaluate the treatment of renal osteodystrophy found a significant decrease in bone mineral content in women as compared to men. The researchers concluded that women who had peritoneal dialysis as first mode demonstrated a significant decrease in bone mineral content as compared to men even though lab values and body weight demonstrated better treatment outcomes in the female groups. Lyhne and Pedersen also concluded that the significant decrease in bone mineral content of females on dialysis suggest severe skeletal imbalances which could indicate a sex hormone related disturbance.

Few studies have specifically addressed current HRT prescription. In 1999, Gillen et al. conducted a secondary
analysis of 1,499 females ages 45 and older and on dialysis using data from the United States Renal Data Systems (USRDS) Dialysis Morbidity and Mortality Study (DMMS) Wave 2. They sought to assess the prevalence and predictors of HRT in postmenopausal women with ESRD. Gillen et al. (1999) determined the prevalence of HRT prescription among the subjects was 10.8% (162 out of 1,499); and for each decade of life, subjects were 26% less likely to be prescribed HRT. Gillen et al. (1999) cited factors which might explain the overall low rate of HRT prescription in postmenopausal women with ESRD, including physician attitude, ethnicity, secular trends, and geographic location. The most important predictors of HRT prescription in postmenopausal women with ESRD found by their researchers were younger age, higher education, white race, and ambulatory status.

Recent studies have documented a significant decrease in CVD mortality among women who received HRT. Ginsburg et al. (1998) conducted a study of women ages 45 years and older with renal failure to examine the effects of estrogen therapy on lipoproteins. The researchers found a 20% increase in HDL after only 4 weeks of oral estradiol 1 mg. Previous studies in patients with no renal failure have suggested that comparable increases in HDL are expected to decrease the risk of CVD by 50%. Many
treatments for hyperlipidemia in the ESRD population have been evaluated, including gemfibrozil, probucol, lovastatin, and simvastatin. Many of these lipid-lowering agents have major side effects, such as rhabdomyolysis and elevated hepatic transaminases. The researchers concluded that similar benefit from estrogen replacement therapy may be achieved with fewer side effects, and they advocated the use of 1 mg estradiol for future trials to minimize the risks associated with higher hormone levels.

In conclusion, the review of literature supported the current study which found that approximately 10% of postmenopausal women receive HRT. The literature review also supported the need for more research concerning menopause among women with ESRD.
Chapter III
The Method

This researcher sought to identify the barriers and facilitators to nephrology health care providers initiating hormone replacement therapy (HRT) in postmenopausal women with end-stage renal disease (ESRD). Nephrology health care providers in Alabama, Mississippi, and Tennessee were surveyed utilizing a researcher-developed tool, Tramel’s Questionnaire, to identify current HRT prescribing practices. An open-ended question was provided for additional information. Included in this chapter are study design, setting, population and sample, instrumentation, procedures, and data analysis.

Design of the Study
A descriptive study design was used since the researcher sought to explore and document aspects of a setting as it occurs naturally (Polit & Hungler, 1999). The aim of this descriptive study was to identify the barriers and motivators to nephrology health care providers initiating HRT in their postmenopausal clients.
Setting, Population, and Sample

The setting for this study was outpatient hemodialysis facilities in Alabama, Mississippi, and Tennessee. The total number of dialysis facilities in these three states is approximately 300. The patient census for each unit varies from 10 to 100 patients. Currently, there are approximately 15,000 ESRD patients receiving dialysis at these facilities. The target population was nephrology health care providers in Alabama, Mississippi, and Tennessee who care for postmenopausal women aged 45 years or older who have had ESRD for more than 6 months. There are an estimated 200 nephrologists in the tri-state region (T. Wooldridge, MD, personal communication, May 8, 2001). The target sample consisted of 100 subjects who met criteria and completed and returned the questionnaire. The actual sampling was 26 which represents a 17% return.

Instrumentation

Tramel’s Questionnaire, a researcher-developed instrument, was utilized to collect data concerning demographic and descriptive practices of nephrology health care providers in Alabama, Mississippi, and Tennessee regarding HRT in their postmenopausal women with ESRD. The instrument is assumed to face validity within the confines
of this study as it was reviewed by a panel of research experts and piloted for clarity by a health care provider in nephrology. Since there is no summative score, questions were analyzed independent of each other.

**Procedures**

Prior to implementation of this study, permission was obtained from the Mississippi University for Women Committee on Use of Human Subjects in Experimentation (see Appendix A). ESRD facilities addresses were obtained from Network 8, a Health Care Financing Committee (HCFA), data collection agency. Ten dialysis facilities in Alabama, Mississippi, and Tennessee were each sent a packet of five of the following: Tramel’s Questionnaire (see Appendix B), cover letter with information about the study (see Appendix C), and a stamped, self-addressed return envelope. A follow-up postcard was mailed to the dialysis facilities 2 weeks later (see Appendix D). This approach only stimulated five returns. A telephone conference of research committee members was set up to choose an alternative data collection method. The committee decided that personal contact per telephone with nephrology health care providers was appropriate. Thirty nephrologists were contacted in Alabama, Mississippi, and Tennessee; packets were faxed to the care provider with the same information.
that was originally sent (see Appendix E). Employing both methods of data collection, a final sample of 26 (17% return) was achieved. Confidentiality was maintained as no survey had any identifying data. Return of the questionnaire indicated the subject’s consent to participate. Data collection took place during the months of April and May 2001.

Data Analysis

Questions 1 and 2 are demographic questions and require a check (✓) only response. Questions 3, 4, 5, and 6 deal with patient load and require either a check (✓) or fill-in-the-blank response. Descriptive statistics including frequency distribution, percentages, and means were utilized to analyze these questions. Questions 7, 8, and 9 concern barriers and facilitators to HRT initiation and required the health care provider to rank five responses in order of importance: 1 (the most prevalent) and 5 (the least prevalent). Question 10 was an open-ended question and prompted the nephrology health care provider to write comments relevant to the research study. Only four responses were received for Question 10. Content analysis was used to identify themes; facilitators and barriers to HRT initiation were discussed in the open-ended question. Among the comments were the need for more
research, lack of educational opportunities, and inability to monitor the patient if prescribed HRT.

Summary

The purpose of this study was to describe facilitators and barriers to initiation of HRT by nephrology health care providers among postmenopausal women with ESRD. A researcher-developed questionnaire, Tramel's Questionnaire, was used to collect data. Descriptive statistics, including ranking, frequency distribution and percentages, were utilized to analyze the data.

Chapter III described empiricalization of the study. Chapter IV will discuss the findings, and Chapter V will describe the outcomes of the study.
Chapter IV

The Findings

The purpose of this descriptive, nonexperimental study was to identify the factors that influence nephrology health care providers to prescribe hormone replacement therapy (HRT) for postmenopausal women under their care. The research questions that guided this study were as follows:

1. What are the facilitators cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

2. What are the barriers cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

Within Chapter IV, a detailed description of the sample, results of data analysis, and additional findings are presented.

Description of the Sample

One hundred fifty researcher-developed questionnaires were mailed to nephrology health care providers in
Alabama, Mississippi, and Tennessee. Twenty-six questionnaires (17%) were returned. The convenience sample consisted of nephrology health care providers who cared for women, ages 47 years and older, who had renal failure for more than 6 months. Twenty-three (88.46%) of the subjects were board-certified in nephrology, 1 (3.85%) was a medical doctor, and 2 (7.69%) were nurse practitioners. The sample represented three states: Alabama 26.92% (n = 7), Mississippi, 52.31% (n = 11), and Tennessee 26.92% (n = 7). The average number of years practicing as a health care provider was 12.8 years, and the majority (88.77%) of the sample were male. Questions regarding patient population also were included. The majority (26.92%) currently provided care for 301 to 400 ESRD patients; the current range for patients seen was 101 to 700. Subjects reported caring for an average of 138 female patients who met inclusion criteria. Eleven (42.31%) of the male health care providers identified that 6% to 10% of their eligible postmenopausal women were receiving HRT, while the 2 female health care providers identified that > 50% (7.6%) of their eligible women patients were on HRT. Nephrology health care providers were asked how many continuing education units (CEUs) they have received regarding HRT or menopause. An overwhelming 76.92% (n = 20) reported having received no CEUs during the past year; 23.08% (n = 6)
reported 1 to 5 CEUs. Only 12 (46.15%) reported CEUs in the last 5 years and 10 (38.46%) still reported no CEUs.

Results of Data Analysis

The researcher sought to identify facilitators and barriers to initiation of HRT among postmenopausal women with renal failure. The first research question was as follows: What are the facilitators cited by nephrology health care providers to initiation of HRT among postmenopausal women with ESRD? Questions 7 and 9 on Tramel's Questionnaire concerned facilitators. For Question 7 the care provider ranked, in order of importance, reasons they would initiate HRT among their postmenopausal patients. The majority ranked surgically-induced menopause as the number one reason to initiate HRT, and all respondents ranked cardiovascular disease (CVD) protection as the least likely reason to initiate HRT. These factors are regarded as health facilitators (see Table 1).
Table 1

Health Facilitators to HRT Initiation by Nephrology Health Care Providers Using Rank Order by Question

<table>
<thead>
<tr>
<th>Question</th>
<th>State</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>7. Reasons you would initiate HRT in postmenopausal women under your care:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Surgically-induced menopause</td>
<td>AL</td>
</tr>
<tr>
<td></td>
<td>Patients ask for it</td>
<td>AL</td>
</tr>
<tr>
<td></td>
<td>Relief of menopausal symptoms</td>
<td>AL</td>
</tr>
<tr>
<td></td>
<td>Prevention of osteoporosis</td>
<td>AL</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular disease protection</td>
<td>AL</td>
</tr>
<tr>
<td></td>
<td>Surgically-induced menopause</td>
<td>MS</td>
</tr>
<tr>
<td></td>
<td>Patients ask for it</td>
<td>MS</td>
</tr>
<tr>
<td></td>
<td>Relief of menopausal symptoms</td>
<td>MS</td>
</tr>
<tr>
<td></td>
<td>Prevention of osteoporosis</td>
<td>MS</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular disease protection</td>
<td>MS</td>
</tr>
<tr>
<td></td>
<td>Surgically-induced menopause</td>
<td>TN</td>
</tr>
<tr>
<td></td>
<td>Relief of menopausal symptoms</td>
<td>TN</td>
</tr>
<tr>
<td></td>
<td>Patients ask for it</td>
<td>TN</td>
</tr>
<tr>
<td></td>
<td>Prevention of osteoporosis</td>
<td>TN</td>
</tr>
<tr>
<td></td>
<td>Cardiovascular disease protection</td>
<td>TN</td>
</tr>
</tbody>
</table>

Note. AL = Alabama. MS = Mississippi, TN = Tennessee.

Alabama (n = 7), Mississippi (n = 11), Tennessee (n = 7).

For Question 9 care providers ranked factors that would make it easier or more convenient to prescribe HRT. The majority ranked the need for more research prior to their initiating HRT as number one. The development of a pocket guide was considered last as a facilitator by all
respondents. These factors are considered external facilitators and are listed in Table 2.

Table 2

External Facilitators to HRT Initiation by Nephrology Health Care Providers Using Rank Order by Question

<table>
<thead>
<tr>
<th>Question</th>
<th>State</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>9. What would make it easier or more convenient for you to prescribe HRT?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Journal articles</td>
<td>AL</td>
<td>1</td>
</tr>
<tr>
<td>More research</td>
<td>AL</td>
<td>2</td>
</tr>
<tr>
<td>Presentations</td>
<td>AL</td>
<td>3</td>
</tr>
<tr>
<td>Continuing education units (CEUs)</td>
<td>AL</td>
<td>4</td>
</tr>
<tr>
<td>Pocket guide</td>
<td>AL</td>
<td>5</td>
</tr>
<tr>
<td>More research</td>
<td>MS</td>
<td>1</td>
</tr>
<tr>
<td>Presentations</td>
<td>MS</td>
<td>2</td>
</tr>
<tr>
<td>Journal articles</td>
<td>MS</td>
<td>3</td>
</tr>
<tr>
<td>Continuing education units (CEUs)</td>
<td>MS</td>
<td>4</td>
</tr>
<tr>
<td>Pocket guide</td>
<td>MS</td>
<td>5</td>
</tr>
<tr>
<td>More research</td>
<td>TN</td>
<td>1</td>
</tr>
<tr>
<td>Presentations</td>
<td>TN</td>
<td>2</td>
</tr>
<tr>
<td>Journal articles</td>
<td>TN</td>
<td>3</td>
</tr>
<tr>
<td>Continuing education units (CEUs)</td>
<td>TN</td>
<td>4</td>
</tr>
<tr>
<td>Pocket guide</td>
<td>TN</td>
<td>5</td>
</tr>
</tbody>
</table>

Note. AL = Alabama. MS = Mississippi, TN = Tennessee.

Alabama (n = 7), Mississippi (n = 11), Tennessee (n = 7).

The second research question was as follows: What are the barriers to initiation of HRT among postmenopausal women with ESRD? For Question 8 nephrology health care
providers ranked, in order of importance, reasons they would not initiate HRT. The majority ranked physician liability as the number one reason they would not initiate HRT and ranked CVD as the least important reason they would not initiate HRT (see Table 3).

Table 3

<table>
<thead>
<tr>
<th>Question</th>
<th>State*</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Reasons you would not initiate HRT in postmenopausal women under your care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD liability</td>
<td>AL</td>
<td>1</td>
</tr>
<tr>
<td>Unsure of type and dose to prescribe</td>
<td>AL</td>
<td>2</td>
</tr>
<tr>
<td>View as primary care/gyn</td>
<td>AL</td>
<td>3</td>
</tr>
<tr>
<td>Concerns of adverse effects</td>
<td>AL</td>
<td>4</td>
</tr>
<tr>
<td>Preexisting cardiovascular disease</td>
<td>AL</td>
<td>5</td>
</tr>
<tr>
<td>View as primary care/gyn</td>
<td>MS</td>
<td>1</td>
</tr>
<tr>
<td>MD liability</td>
<td>MS</td>
<td>2</td>
</tr>
<tr>
<td>Preexisting cardiovascular disease</td>
<td>MS</td>
<td>3</td>
</tr>
<tr>
<td>Concerns of adverse effects</td>
<td>MS</td>
<td>4</td>
</tr>
<tr>
<td>Unsure of type and dose to prescribe</td>
<td>MS</td>
<td>5</td>
</tr>
<tr>
<td>8. Reasons you would not initiate HRT in postmenopausal women under your care</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MD liability</td>
<td>TN</td>
<td>1</td>
</tr>
<tr>
<td>View as primary care/gyn</td>
<td>TN</td>
<td>2</td>
</tr>
<tr>
<td>Concerns of adverse effects</td>
<td>TN</td>
<td>3</td>
</tr>
<tr>
<td>Preexisting cardiovascular disease</td>
<td>TN</td>
<td>4</td>
</tr>
<tr>
<td>Unsure of type and dose to prescribe</td>
<td>TN</td>
<td>5</td>
</tr>
</tbody>
</table>

Note. AL = Alabama. MS = Mississippi, TN = Tennessee.

*Alabama (n = 7), Mississippi (n = 11), Tennessee (n = 7).
Only 4 subjects responded to Question 10 on Tramel's Questionnaire. This open-ended question allowed for comments relevant to this study. There was no emergent theme. However, the researcher took the liberty of classifying responses as either facilitators or barriers.

**Facilitators**

I would definitely like to see more research concerning HRT in our patient population. [External facilitator]

...  

Presentations, especially for nurse practitioners in nephrology, would be helpful.

**Barriers**

I am based in an acute care setting and not directly involved in prescribing routine medications and would not have the opportunity to monitor the patient in this setting.

...  

I feel that nurse practitioners practicing in nephrology do not have enough educational opportunities specifically addressing the ESRD patient on the local level.

...  

Coverage and financial issues are barriers to attending national meetings.

**Limitations**

The researcher identified the following potential limitations for this study. A sample bias due to limited geographic setting and small sample size could have been
present which would prevent generalization of the results. However, due to limited time and financial support, the researcher made efforts to include at least representation from three states. Opportunity to participate was provided for 150 prospective nephrology health care provider.

There were some methodological constraints. The researcher-developed instrument had no validity established and may not have represented all facilitators or barriers for choice. However, the researcher did identify potential facilitators and barriers to HRT prescription from the review of literature. Further, the questions were reviewed by a nephrology health care provider and a research committee of experts. The instrument was assured to have face validity within confines of this study. Another methodology concern to this researcher was the subject recruitment process. The mailed survey process failed as it only stimulated five respondents, personal contact by phone was then made with 45 nephrology health care providers. This second process stimulated 21 respondents. These subjects may have responded to please the researcher.

Summary

The purpose of this study was to describe facilitators and barriers to initiation of HRT among
postmenopausal women with ESRD. Analysis of responses recorded on Tramel’s Questionnaire regarding these factors was described in this chapter. The sample consisted of 26 nephrology health care providers who currently practice and care for ESRD patients in Alabama, Mississippi, and Tennessee. Only two respondents were nurse practitioners. Descriptive statistics, including frequency distribution, percentage and ranking, were utilized to analyze the data. Nephrology health care providers were 80.77% (n = 21) male and practiced nephrology for an average 12.8 years. The average number of postmenopausal women under their care was 138 while 42.31% (n = 11) reported prescribing HRT for these women. Tramel’s Questionnaire reported an overwhelming 76.92% (n = 20) received no CEUs during the past year while only one to five CEUs were reported during the last 5 years by the majority of nephrology health care providers (42.31%, n = 12). Health facilitators ranked as number one were surgically-induced menopausal. External facilitators that ranked as number one was the need for more research in the area of HRT for women with renal failure. The number one ranked barrier to HRT initiation was concerns of physician liability.
The population of postmenopausal women in the United States is increasing at an exponential rate. In 1990 there were 28.7 million women older than 55 years of age; by the year 2020 this group is estimated to be 45.9 million. In 1999 over 31 million women began the menopausal transition (Lobo, 1999). As the general population ages, the number of postmenopausal women with end-stage renal disease (ESRD) also will increase. The prevalence rate for ESRD among postmenopausal women was 607 per million in 1991 and had climbed to 931 per million in 1997 (Mattix & Singh, 2000). Cardiovascular disease (CVD), osteoporosis, and dementia are three disease processes that profoundly affect the quality of life and health of ESRD patients who are menopausal (D. Arnold, personal communication, May 14, 2001).

Nephrology health care providers have ignored the issue of hormone replacement therapy (HRT) in their postmenopausal patients despite mounting evidence that estrogen therapy could possibly decrease morbidity and
mortality and positively influence quality of life (Mattix & Singh, 2000). In an effort to better understand the disparity of HRT prescription in women with ESRD, this researcher explored the prescription practices of nephrology health care providers regarding initiation of HRT. The research questions that guided this study were as follows:

1. What are the barriers cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

2. What are the facilitators cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

Pender's Health Promotion Model was the theoretical framework used to guide this study. Within this chapter the outcomes, implications, and recommendations that evolved from this study are presented.

Description of the Sample

A convenience sample of 26 nephrology health care providers who care for women, are at least age 47 years old, and have had renal failure for more than 6 months. The majority (88.46%) of the nephrology health care providers were board certified in nephrology, were practicing in Mississippi (52.31%), and were male
(88.77%). The average number of years practicing as a health care provider was 12.8 years. Questions regarding patient population also were included on the questionnaire. The majority (26.92%) are health care providers for 301 to 400 ESRD patients; the range for patients seen was 101 to 700. Nephrology health care providers reported caring for an average of 138 female patients age 47 and older, and the majority (42.31%, \( n = 11 \)) reported 6-10% of these women currently received HRT. The researcher sought to determine the number of continuing education units (CEUs) care providers had received regarding HRT or menopause. An overwhelming 76.92% (\( n = 20 \)) reported having received no CEUs during the past year.

**Summary of Significant Findings**

The research questions that guided this study were as follows:

1. What are the barriers cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?

2. What are the facilitators cited by nephrology health care providers to initiate HRT for postmenopausal women with end-stage renal disease?
Using a ranking format the number one health facilitator cited by nephrology health care providers to initiate HRT was surgically-induced menopause, and the number one reported external reason nephrology health care providers would initiate HRT was more research to validate benefits verses adverse effects within this population of patients. The most ranked barrier for the nephrology health care providers to initiate HRT was concern of liability.

Discussion Related to Findings

Since there were no empirical studies that specifically dealt with barriers and facilitators to prescribing HRT, the findings of this research can neither be supported nor refuted. Of particular interest to the current researcher were established facilitators of HRT such as the prevention of osteoporosis, CVD, dementia, and quality-of-life improvement in women eligible for HRT who have renal failure. Clinical evidence to support the use of HRT as primary prevention clearly exists; however, nephrology health care providers seem to ignore this treatment and opt not to prescribe HRT to their postmenopausal patients. There was support found establishing the preventative benefits of HRT by Matuszkiewicz-Rowinska et al. (1999) who concluded that
normalization of serum oestradiol levels with use of HRT is sufficient to prevent bone loss and increase bone formation. Nephrology health care providers in this current study ranked that response as number four in order of importance for initiating HRT.

Consideration of HRT as a preventive action for CVD was confirmed by Mattix and Singer (2000). These researchers concluded that CVD in patients with renal failure had reached epidemic proportions and that 42% of all deaths in women age 45 to 64 years was due to CVD. Ginsburg et al. (1998) also contributed to the position of HRT as a preventive treatment when they determined that oral estradiol increases total HDL. Previous studies in patients with no renal failure have suggested that comparative increases in HDL are expected to decrease the risks of CVD by 50%. For the current study, subject responses did not support the concern for prevention of CVD as they ranked that response as number five, or last in order of importance on Question 7.

There were concerns in Ginsberg et al.'s (1998) study about side effects of estrogen replacement therapy among women with renal failure. Question 8 addressed this issue. When the subjects ranked reasons they would not initiate HRT, they chose concerns of adverse effects of HRT as
number three of five, which does not support Ginsburg et al’s position.

Matuszkiewicz-Rowinska et al. (1999) discovered a substantial improvement in sexual function, mood, and mental alertness, and an improvement in general well-being, factors that have a significant role in quality of life. Relief of symptoms of menopause as a response, which would contribute to quality of life, was identified as a selection to initiate HRT. Care providers ranked this as number three. Also, “patients ask for it” was the number two response which somewhat supports Matuszkiewicz-Rowinska et al. (1999) research for when patients ask for HRT there is an implied need to feel better.

Gynecological surveillance is important to all women with ESRD. Cochrane and Regan (1997) confirmed the value of gynecological surveillance in that 80% of abnormalities found in their subjects would have been missed had the researchers not performed cervical smears on all patients. Cochrane and Regan also found 53 of the 100 women required contraception and that counseling in this regard had been inappropriate or nonexistent. The current study results support the need for gynecological surveillance as the average number of female patients age 47 and older seen by the nephrology health care provider was 138 representing 42% of all their patient.
Eleven (42.31%) of the male health care providers identified that 6-10% of their eligible postmenopausal women were receiving HRT, while the two female health care providers identified that > 50% (7.6%) of their eligible female patients were on HRT. This finding supports the Health Promotion Model in that modifying factors, such as gender, race, and age, directly influence health-promoting behaviors.

Gillen et al. (1999) cited factors which might explain the overall low rate of HRT prescription in postmenopausal women with ESRD. These researchers suggested that physicians' attitudes, ethnicity, secular trends, and geographical location may have impacted the prescribing patterns of these nephrology health care providers. The current study’s subjects in these southeastern states were predominantly male (80.77%) with a general lack of knowledge regarding women’s health as evidenced by their response of uncertainty of dose to prescribe HRT. While ethnicity or secular trends were not identified in the current study, it is possible that the southeastern geographical location could have influenced these nephrology health care providers. Physician liability was ranked as the number one reason for not prescribing HRT. This factor either indicates true lack of knowledge in regards to HRT or that HRT is viewed by the
sample as an area for treatment solely ascribed to the primary care provider. Another interpretation might be that nephrology health care provider’s are simply not interested in women’s health issues for they answered a lack of interest in both continuing education units related to HRT and no desire to possess an HRT pocket guideline. The need for increased knowledge may be masked or denied by the provider as exhibited in Question 8 when physician liability was chosen as the reason they would not initiate HRT in their postmenopausal patients. This answer may indicate that these nephrology health care providers do lack the ability to assess, manage, and evaluate the use of HRT. Providers also tended to prescribe HRT only when they had to for surgically-induced menopause and when patients ask for it were ranked as the number one and two reasons to prescribe HRT by these health care providers.

Conclusion

Nephrology health care providers identified facilitators of HRT prescription as surgically-induced menopause and the need for more research of HRT among women with renal failure. Nephrology health care providers ranked concern of liability as the number one barrier to HRT prescription. Clearly the health care provider sample
is not prevention care focused nor are they aware of current positive research of benefits associated with HRT. These findings and this researcher’s position are neither supported nor refuted in the literature.

Eleven (42.31%) of the male health care providers identified that 6 to 10% of their eligible postmenopausal women were receiving HRT, while the 2 female health care providers identified that > 50% (7.6%) of their eligible female patients were on HRT. This finding supports the Health Promotion Model (Pender, 1996) in that modifying factors, such as race, gender, or age, are factors that directly impact health-promoting behaviors. This finding also supports Gillen et al. (1999) who cited physician attitude, ethnicity, secular trends, and geographical location as factors, which might explain the overall low prescription rate of HRT among women with renal failure.

The researcher recognized two potential limitations that may have impacted study results: a potential sample bias due to limited geographic setting and small sample size and methodological concerns.

Implications for Nursing Practice. The documented benefits of HRT have significance for postmenopausal women with ESRD disease. The younger age for entering menopause in this population
of patients removes the protective cardiovascular, cognitive, and bone mass effects of estrogen. Women with ESRD have a higher risk for cognitive dysfunction, renal osteodystrophy, accelerated atherosclerosis, and cardiovascular disease compared to the general population. Cardiovascular disease accounts for nearly half of the mortality in dialysis patients each year. The potential benefits of HRT for women with ESRD are numerous. The cardiovascular protective effects alone could significantly decrease related morbidity and mortality as well as a substantial decrease in associated health care costs (Gipson, 1999). Nephrology health care providers are in a unique position to initiate HRT as physicians and nurse practitioners see dialysis patients on a weekly basis. By viewing HRT as preventive medicine, these health care providers could dramatically impact related morbidity and mortality in postmenopausal women with ESRD as well as improve their quality of life by decreasing depression and enhancing mood. Nurse practitioners’ are educated to assess and treat the woman holistically. The nephrology nurse practitioner could augment the care of the nephrologist by initiating and monitoring with HRT and providing teaching, counseling, and prevention reflecting contraception, pregnancy, and menopause.
Research. Advanced practice nurses in nephrology should conduct more research regarding benefits of HRT prescription to postmenopausal women with renal failure. The current researcher clearly identified this need as it was ranked as the number one external facilitator to HRT initiation. The importance of publishing and presenting this research at regional and national Nephrology meetings is crucial.

Theorist. Pender's Health Promotion Model identifies cognitive-perceptual factors that influence care providers to initiate behaviors that are focused on health promotion and disease prevention. Nephrology health care providers clearly have ignored the use of HRT as both disease prevention and health enhancing. The beliefs of nephrology health care providers about primary prevention, importance of health, and perceived benefits to health-promoting behaviors are concepts from the Health Promotion Model that are applicable to this study. Health care providers working in nephrology must buy into the perceived benefits of HRT. According to Pender, endorsing this concept would make them more apt to refer, teach, counsel, and assess their postmenopausal patients for signs of estrogen deficiency. Another concept in the Health Promotion Model is importance of health; if health care providers recognized HRT as important to health, they would be more
apt to prescribe. If they support the benefits of HRT, this can be either a facilitator or a barrier.

**Recommendations**

Based on the findings of this study, the following recommendations were made:

**Research**

1. Replication of this study with a larger sample including more women providers.

2. Replication of this study with an instrument which has established validity and reliability.

3. Development of outcome measures for CEUs which has a focus on HRT for all nephrology health care providers.

**Nursing practice**

1. Initiation of HRT as a primary prevention strategy for postmenopausal women with renal failure by nephrology nurse practitioners.

2. Avocation by Nurse Practitioners working in nephrology for all female patients with ESRD to have annual history and physical, which includes gynecological surveillance.
References


Available: Internet: 
http://womenshealth.medscape.com/Medscape/WomensHealthUpdate.com


http://www.innerself.com/Health/menopause
APPENDIX A

APPROVAL OF MISSISSIPPI UNIVERSITY FOR WOMEN’S COMMITTEE ON USE OF HUMAN SUBJECTS IN EXPERIMENTATION
February 23, 2001

Ms. Lynn Trammell  
c/o Division of Nursing  
P. O. Box W-910  
Campus

Dear Ms. Trammell:

I am pleased to inform you that the members of the Committee on Human Subjects in Experimentation have approved your proposed research as submitted.

I wish you much success in your research.

Sincerely,

Vagn K. Hansen, Ph.D.  
Vice President  
for Academic Affairs

cc: Mr. Jim Davidson  
Dr. Mary Pat Curtis

Where Excellence is a Tradition
APPENDIX B

TRAMEL’S QUESTIONNAIRE
Tramel's Questionnaire

Please answer the following questions by filling in the blank or placing a check (✔) by the appropriate answer.

1. Are you a
   ☐ a. MD
   ☐ b. Board certified nephrologist
   ☐ c. NP

In the state of (please check one)
   ☐ a. Alabama
   ☐ b. Mississippi
   ☐ c. Tennessee

If NP, please indicate clinical speciality area of NP preparation and any additional certifications or specialty training in the nephrology field.

____________________________________________________________________________________

2. Years practicing as a nephrology health care provider:_________

   Gender
   ☐ a. Male
   ☐ b. Female

3. Please estimate the total number of patients you care for:

   ☐ a. Less than 100
   ☐ b. 101 to 200
   ☐ c. 201 to 300
   ☐ d. 301 to 400
   ☐ e. 401 to 500
   ☐ f. 501 to 600
   ☐ g. 601 to 700
   ☐ h. 701 to 800
   ☐ i. More than 800

4. Please estimate the number of female patients age 47 and older whom you care for:________________________

5. Of these patients, what percent are on any form of estrogen replacement?

   ☐ a. 0
   ☐ b. 1 to 5%
   ☐ c. 6 to 10%
   ☐ d. 11 to 15%
   ☐ e. 16 - 20%
   ☐ f. 21 to 25%
   ☐ g. 26 to 30%
   ☐ h. 31 to 35%
   ☐ i. 36 to 40%
   ☐ j. 41 to 45%
   ☐ k. 46 to 50%
   ☐ l. More than 50%
6. Please approximate how many CEUs you have had on HRT or menopause in the last year:
   □ a. 0
   □ b. 1 to 5
   □ c. 6 to 10
   □ d. 11 to 15
   □ e. 16 to 20
   □ f. 21 to 25
   □ g. 26 to 30
   □ h. More than 31

Last 5 years:
   □ a. 0
   □ b. 1 to 5
   □ c. 6 to 10
   □ d. 11 to 15
   □ e. 16 to 20
   □ f. 21 to 25
   □ g. 26 to 30
   □ h. More than 31

For the following 3 questions, please rank in order of importance:

7. Reasons you would initiate HRT in postmenopausal women under your care:
   _____ a. Relief of menopausal symptoms such as decreased libido, depression, mood swings, and hot flashes.
   _____ b. Prevention of osteoporosis
   _____ c. Cardiovascular protective effects
   _____ d. Patients ask for it
   _____ e. Surgically-induced or premature menopause
   _____ f. Other. Comments:______________________________

8. Reasons you would not initiate HRT in postmenopausal women under your care:
   _____ a. View as primary care or as gyn specialty
   _____ b. Physician liability; concerns with patient compliance with follow-up care (pap smear)
   _____ c. Concerns about adverse effects of HRT in your patients
   _____ d. Client has preexisting cardiovascular disease.
   _____ e. Unsure of what type and dose to prescribe
   _____ f. Other. Comments:______________________________

9. What would make it easier or more convenient for you to prescribe HRT?
   _____ a. CEUs
   _____ b. Pocket Guide
   _____ c. More research concerning benefits and or adverse reactions in ESRD patients
   _____ d. Journal articles
   _____ e. Presentations at national/international meetings
   _____ f. Other. Comments:______________________________

10. Please feel free to make any comments relevant to this research study:
    ________________________________
    ________________________________
    ________________________________
APPENDIX C

COVER LETTER TO PARTICIPANTS
Lynn Tramel
26 CR 403
Oxford, MS 38655

Dear Head Nurse or Charge Nurse,

I am a nephrology nurse of 18 years and a graduate student at Mississippi University for Women. I am conducting a research study about hormone replacement therapy (HRT) in postmenopausal women with ESRD. I have found a limited amount of research literature concerning benefits and or specific risk factors in this population of patients.

I have enclosed 5 copies of a questionnaire concerning HRT. Would you please give each nephrologist and or nurse practitioner a packet? If they would like to participate in the study, please ask each one to fill out the questionnaire and return it in the enclosed self-addressed, stamped envelope. Return of the questionnaire implies consent. Participation is voluntary, and confidentiality will be maintained as no identifying names will appear on the forms.

The majority of female patients are postmenopausal, and this in itself has many health-related problems. These problems compact the already complicated medical issues that our patients must deal with on a daily basis. It is my desire to research this area in hopes of improving the quality of life for these women.

Thank you in advance for your time and participation; coming from a hemodialysis background for many years, I realize how busy you are and I am deeply grateful for your assistance.

Sincerely,

Lynn Tramel
Dear Head Nurse or Charge Nurse,

Just a friendly reminder about the questionnaire concerning hormone replacement therapy in your postmenopausal patients. Your input is much needed and appreciated. If you have completed and returned the questionnaire, thank you for your participation. If you have not, please consider doing so.

Again, thank you in advance for taking the time to participate in my study.

Sincerely,

Lynn Tramel
APPENDIX E

COVER LETTER TO NEPHROLOGY HEALTH CARE PROVIDERS
Dear Nephrology Health Care Provider,

I am a nephrology nurse of 18 years and a graduate student at Mississippi University for Women in Columbus, Mississippi. I am conducting a research study about hormone replacement therapy (HRT) in postmenopausal women with ESRD and would like for you to participate in my study.

Enclosed please find a survey that I am using for my research study. If you would like to participate, please complete the questionnaire and return in the enclosed self-addressed, stamped envelope. Return of the questionnaire implies consent. Participation is voluntary, and confidentiality will be maintained as no identifying names will appear on the forms.

Thank you in advance for your time and participation; coming from a hemodialysis background for many years, I realize how busy you are, and I am deeply grateful for your assistance.

Sincerely,

Lynn Tramel