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**Description of estrogen therapy in older women of middle or
upper income in a retirement community in the Southwest**

Marsden, Treva Marie, M.S.

The University of Arizona, 1993

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**DESCRIPTION OF ESTROGEN THERAPY IN OLDER
WOMEN OF MIDDLE OR UPPER INCOME IN A
RETIREMENT COMMUNITY IN THE SOUTHWEST**

by

Treva Marie Marsden

A Thesis Submitted to the faculty of the
COLLEGE OF NURSING
In Partial Fulfillment of the Requirements
for the Degree of
MASTER OF SCIENCE WITH A MAJOR IN NURSING
In the Graduate College
THE UNIVERSITY OF ARIZONA

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STATEMENT BY THE AUTHOR

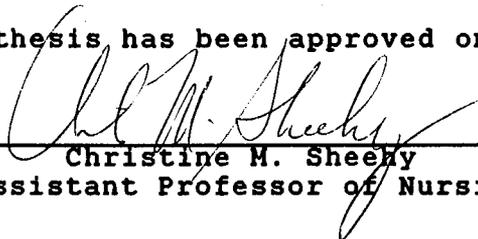
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I thank God for the wondrous Montana mountains, for a father who taught me to appreciate them, for hot popcorn on a blistery day, for a warm, caring smile, and for other gifts of life that inspire a day of hard work.

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ABSTRACT

The population today is getting older, leading to increases in the number of women in the postmenopausal stage of life. The fact that women in the United States have an average life expectancy of 79 years, means that approximately one third of a women's life will be spent after menopause (Odom, Carr, & MacDonald, 1990). For nurses working with older populations, estrogen replacement therapy is a common issue to confront. It is of considerable concern then that more knowledge be obtained on hormone replacement therapy (HTR) and on characteristics of those women who elect to use HTR.

The purpose of this study was to describe the profile of one group of older, middle-income women, on estrogen replacement therapy. In this study, premarin was the most common method of estrogen replacement therapy. A majority of the sample practiced the health promotion behaviors of no smoking, limited fat intake and regular exercise. Approximately 85% (n = 41) of the sample had a papanicolaou smear within the past two years, 92% (n = 44) had a mammogram within the past one year and 59% performed occasional breast self exam.

CHAPTER ONE
INTRODUCTION

The most dramatic physiological change in older females is the transitional period termed the 'climacteric'. This period of waning ovarian function can last as long as 20 years and will carry a women through decreased fertility, menopause, and manifestations of progressive tissue atrophy and aging (Byyny & Speroff, 1990). The primary physiological mechanism in this evolutionary period is decreased estrogen production. The human ovary becomes unresponsive to gonadotropins with advancing age and ovarian function declines. The ovaries no longer secrete progesterone and 17 Beta-estradiol in appreciable quantities and estrogen is only formed in small amounts (Ganong, 1987).

Background

The median age of menopause onset in the United States is approximately 50 years (Krailo & Pike, 1983). This typical age of onset has not changed significantly over time. However, persons who smoke cigarettes experience an earlier spontaneous menopause than nonsmokers (Baron, 1984; McKinlay, Bifano, & McKinlay, 1985; Odom et al., 1990).

The number of women in the postmenopausal stage of life is increasing. Projections indicate that there will be nearly 40 million menopausal women over 50 years of age by the end of the 20th century (Byyny & Speroff, 1990). Current life expectancy is such that approximately one third of a woman's life will be spent in postmenopausal years.

Estrogen deficiency in postmenopausal women produces symptoms that can cause significant physical, emotional, and economic problems. The menopausal syndrome represents a spectrum of symptoms, which include: the hot flush (vasomotor instability), dryness and atrophy of the urogenital epithelium and vagina, osteoporosis, and psychological symptoms of mood changes, irritability, and nervousness (Hazzard, Andres, Bierman, & Blass, 1990). Cardiovascular disease has also been identified as a health problem secondary to long-term deprivation of estrogen (Byyny & Speroff, 1990). The majority of women (i.e., 50-60%) require medical assistance and support in managing these symptoms (Byyny & Speroff).

Loss of estrogen is a major factor contributing to the risk of osteoporosis for postmenopausal women; 75% or more of bone loss, which occurs in women during the first 20 years after menopause, is attributable to estrogen deficiency rather than to aging itself (Richelson, Heinz, Warner, Melton, & Riggs, 1984; Nilas & Christiansen, 1987).

Osteoporotic fractures result in substantial financial and personal costs. Women in the age group of 65 and older will be at highest risk for the fractures most commonly correlated with menopause. The burden placed on society in terms of medical care cost in the mid-1980's has been estimated at six to seven billion dollars and by the year 2000, the cost of hip fractures alone may exceed 10 billion dollars (Gillespy & Gillespy, 1991). Christiansen, Riis, and Rodbro (1987) predicted that more than 50% of women over age 65, in the western world, will develop a fracture in later life as a result of osteoporosis. Fractures of the hip are associated with more deaths, disability, and medical costs than all other osteoporotic fractures combined (Rubin, 1991). The consequences of hip fractures are often severe and leave those who once were functioning independently and living alone in need of institutionalization in a long term care facility. (Cummings, Kelsey, Nevitt, & O'Dowd, 1985).

Another consideration, in the decline of estrogen among older women, is the risk of cardiovascular disease. This is significant as cardiovascular disease is still the leading cause of death in the United States. The incidence of cardiovascular disease in women approaches that of men; at age 65, the incidence reaches 20% in both genders (Agner, 1985). Estrogen replacement has been found to reduce the risk of heart disease by as much as 30% to 50% (Jaroff,

1992). Recent research indicates that estrogen promotes higher levels of HDL which reduces arteriosclerosis. This may be related to iron levels (Jaroff), that is, women who are slightly anemic have reduced incidence of heart disease as do men who are anemic. However, postmenopause, when iron levels increase, the incidence of heart disease increases. The relationship between iron levels and heart disease is an area of recent research which may provide a greater understanding of heart disease in both men and women.

An additional beneficial effect of estrogen replacement is in the relief of vasomotor instability and atrophy of the urogenital epithelium. Also stress and urge incontinence can be improved by estrogen therapy due to a direct effect on the urethral mucosa (Byyny & Speroff, 1990).

Despite numerous studies that demonstrate the benefits of estrogen replacement, there remains considerable controversy about the risks associated with estrogen use. Breast and uterine cancer are (potential) negative side effects of estrogen replacement therapy. Furthermore, little is known about the characteristics of woman who are on regimens of estrogen replacement therapy, in terms of age, hemodynamic characteristics (i.e., blood chemistries), and co-morbidity profiles. There is also scant information about health maintenance behaviors including smoking habits, frequency of pap smear and breast mammograms and the

relationship of these to variables such as income and health insurance coverage, which may promote and enhance wellness practices.

Problem Statement

The problem to be investigated in this descriptive study was: what is the profile of older, middle-income women who are on estrogen replacement therapy?

Purpose of Study

The purpose of this study was to describe the profile of one group of older, middle-income women, on estrogen replacement therapy. A second purpose was to identify the types of estrogen replacement therapy prescribed most often and finally, to describe health promotion behaviors, i.e. self breast examination, mammogram, papanicolaou smears, and dietary fat intake practiced by this group of women.

Research Questions

1. What is the profile for age, educational level, smoking history, fat intake, activity level, cardiovascular, arthritis and osteoarthritis disease profile, cholesterol level and source of medical care of older, middle-income women who are on estrogen replacement therapy?

2. What kinds of estrogen replacement therapy are prescribed and which is most often prescribed?
3. Do women on estrogen replacement therapy engage in health promotion behaviors of breast self examination, mammography, and papanicolaou smears?
4. What is the relationship between the self-report about dietary fat intake and actual blood cholesterol level?

Operational Definitions

Smoking History

Measured by self-report questionnaire (Appendix C) within the designated categories: never; smoke but quit; yes, less than 10 cigarettes a day; yes, 10 or more cigarettes a day.

Fat Intake

Measured by self-report questionnaire (Appendix C) relative to limiting high fat foods (such as red meats, pork, sausage, butter, whole milk, or cheese), within the categories: yes or no.

Activity Level

Measured by self-report questionnaire (Appendix C) of participation in vigorous recreational activities (such as dancing, swimming, biking, or energetic walking), according

to the categories: daily, three or more times a week; one or two times a week; rarely or never.

Disease Profile

Measured by self-report questionnaire (Appendix B) of heart disease, arthritis, and osteoporosis in the categories: yes or no.

Source of Medical Care

Measured by self-report questionnaire (Appendix C) of regular source of medical care in the designated categories: private physician, health maintenance organization, emergency room, a clinic or none.

Significance to Nursing

Never before have so many women reached menopausal age. Health care providers today are confronted with many unique challenges in providing care to an increasing number of older clients. Women are outliving men and, therefore, are the largest group of seniors susceptible to acute and chronic health problems. Naierman, Porter, and Lederer (1992) stated another major challenge in women's health care is research in gender related areas. Research into diseases and conditions that exclusively or primarily affect women has lagged (Naierman et al., 1992). Government spending on

research focused on diseases such as osteoporosis, which affects millions of older women in otherwise good health, has not been sufficient. Only \$600 million of the \$250 billion spent annually on health for older Americans goes toward research (Naierman et al., 1992). Research addressing the causes of prevalent diseases, among older women, utilizing preventative measures and treatment is critical in ensuring better health for women in later life.

The benefits of estrogen replacement therapy seem clear in regard to reduction of osteoporosis and heart disease (Lufkin & Ory, 1989; Riis, Thomsen & Christiansen, 1987; Ettinger, Genant, & Cann, 1985; Speroff, Dawson & Speroff, 1987). Nevertheless, estrogen replacement therapy continues to be controversial, due in part to fear of increased risk of cancer and in part to the lack of certainty about the multitude of factors which may affect estrogen replacement therapy. In women under the age of 65, death from breast cancer outnumbers death from ischemic heart disease and stroke combined; however, these numbers are reversed in the postmenopausal age group (Jaroff, 1992).

With the increase in the number of postmenopausal women, it is essential that factors associated with this phenomenon be better understood. Management of the health care needs of postmenopausal women will consume a large portion of the professional nurses' time in years ahead.

This management will include the monitoring of chronic disease, blood lipid levels, self breast exam, diet, and physical activity. Client education by health care providers must include promotion of health behaviors and rationale/risk of medication usage.

Theoretical Framework

The Health Promotion Model (Green & Kreuter, 1991) provides a useful framework for organizing variables important to the exploration of hormone replacement therapy, (HRT) in older women. Although the framework is comprehensive, only a selected portion has been employed for this investigation. The framework consists of seven major constructs: enabling factors, reinforcing factors, behavioral factors, non-behavioral factors, non-health factors, health factors, and quality of life factors.

The model depicts how behavioral and environmental factors influence health status and quality of life. Once these factors have been identified, one may develop health behavior interventions. The authors of the model attempted to organize factors for clinicians identifying the importance of "collective causation" or "contributing causes" in the behavior phenomenon (Green & Kreuter, 1991). The model illustrates that health behaviors are not due to a single factor. Therefore, a problem with one factor in the

model may lead to a compromise in other factors. Seven of the major constructs are briefly summarized to provide an overview (Green and Kreuter, 1991).

Quality of
Life Factors

Factors that individuals or communities define as problems or priorities for themselves. Examples are crime, self-report of quality of health, and discrimination.

Health and
Non-Health
Factors

- A. Health factors are those which are directly related to health, the state of health, and health problems. Included are behavioral/psychological and organic/physiological factors. Examples are the health care situation, history of utilization of resources, and existing diseases.
- B. The factors which are considered non-health are indirectly related to health and could be controlled. Examples are socioeconomic status and income.

Behavioral &
Non-Behavioral
Factors

Specific health behavioral and environmental factors that might be linked to health problems.

- A. Behavioral health factors are those factors contributing to health that can be controlled such as smoking, exercise, drinking, eating, coping and stress mechanisms, and compliance.
- B. Non-behavioral health factors are personal and environmental factors which can effect the health outcome and which are not controlled by one's personal behavior. Some examples are age, gender, family history of disease, developmental stage, and life cycle events.

Predisposing
Enabling and
Reinforcing
Factors

The factors that must be changed to initiate and maintain the behavioral and environmental change process.

- A. Predisposing factors are any characteristic of the patient or consumer which

motivates behavior related to health such as needing to stay in good health in order to bring in income, knowledge, beliefs, values, attitudes, skills and perceptions.

B. Reinforcing factors

are any incentive, reward, or punishment, following or anticipated as a consequence of health behavior. They influence continuance or extinction of the behavior.

Some examples are the supervision or recognition of teachers, spouse, health care providers (i.e., nurse clinicians) or peers.

C. Enabling factors are any

characteristic of the environment which facilitates health behavior. An example is access to care which is made possible by a source of health insurance coverage.

Orem's Nursing Theory

Within the reinforcing factors of Green and Kreuter's (1991) Health Promotion Model is the subset of nurse clinicians. The nursing model of Orem (1980) can be integrated into Green and Kreuter's (1991) model. Figure 1 illustrates the investigator's conceptualization of Orem's theory of Self-Care integrated into Green and Kreuter's Health Promotion model. The health promotion reinforcing and enabling factors directly affect behavioral factors which then can lead to influence any factor within the model. Therefore, Orem's self-care theory is integrated throughout the model. The emphasis of Orem's self-care model of nursing ins clearly a commitment to the concept of self-care. According to Orem, most individuals have an inherent desire to care for themselves. Health promotion with the factors identified by Green and Kreuter (1990) is part of a person's self-care.

Self-care is the "practice of activities that individuals initiate and perform on their own behalf in maintaining life, health, and well-being. If effectively performed, it contributes in specific ways to human structural integrity, human functioning, and human development" (Orem, 1985, p. 84). Self-care is that care given to oneself by oneself.

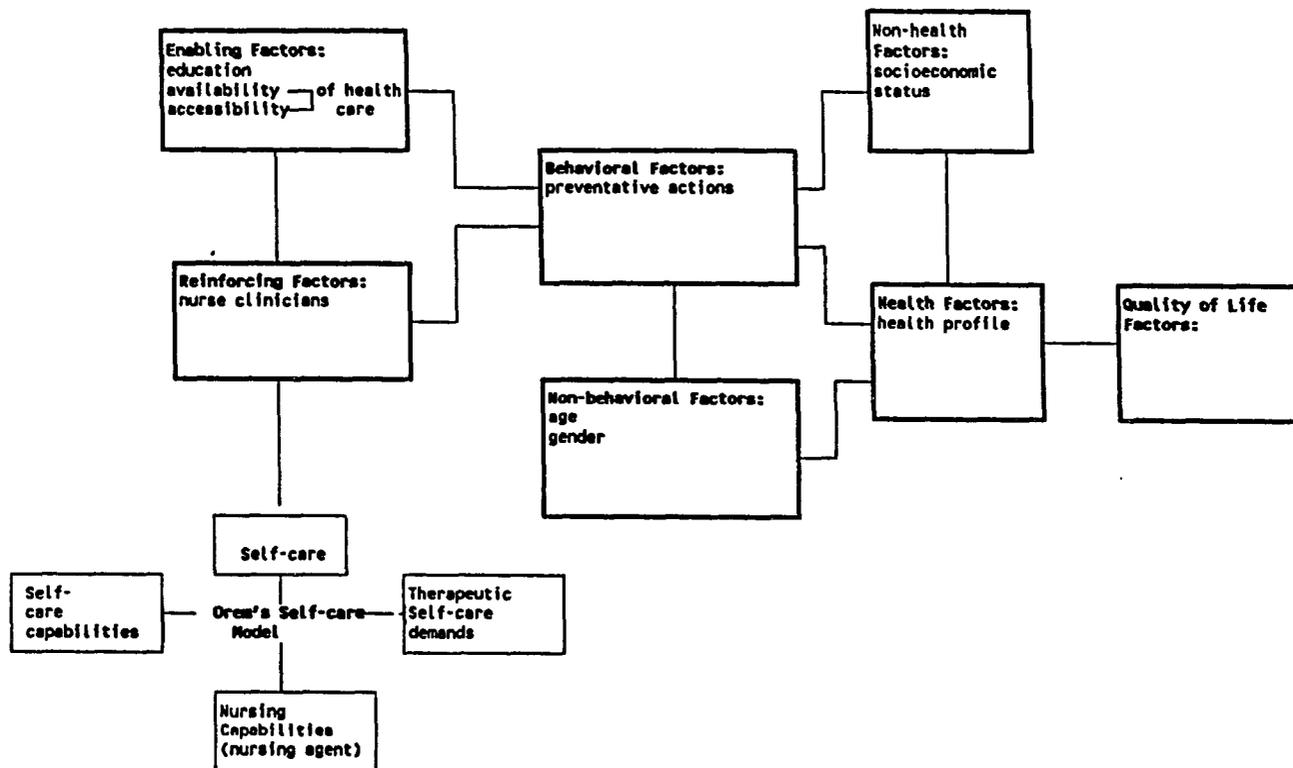


Figure 1. Illustration by investigator conceptualizing the integration of Green and Kreuters' (1991) model with Orem's Self-Care theory.

The concept of nursing within Orem's Self-Care model is that of a helping service. The primary goal of self-care is obtained by the dual role of nurse and patient. In each specific nursing situation the expected behaviors are defined by the perspective roles in the nurse/patient relationship. Nurses assist and care for patients making the decision to receive or not receive hormone replacement therapy and have a role as educators in this particular treatment plan within Orem's framework. Orem distinguishes nursing from medicine by noting that the physician is interested in the disruption of the patients life processes by illness, where as the nurse is interested in continued therapeutic care and the patient's own perspective of the health situation (Fawcett, 1989).

In Orem's model the nurse designs the nursing system, which is based on the self-care needs and abilities of each patient. Orem (1985) identified three classifications of nursing systems to meet the self-care requisites of the patient. These systems are: the wholly compensatory system (patient is totally dependent upon others for his/her existence); partly compensatory system (nurse and patient both contribute to satisfy self-care demand); and supportive-educative system (patient is able to perform yet cannot without assistance). These systems give nurses the justification to intervene and to be a helping service.

Summary

Green's and Kreuters' (1991) Health Promotion Model encompasses several factors that affect health-related behavior and environments. While each of these factors is necessary in the full understanding of the process of the model, it is not within the scope of this study to examine all factors. This study is based on data collected from one annual senior citizen community fair, therefore the data will be applied to selected portions of the Green and Kreuter model: quality of life factors, health factors, non-health factors, behavioral factors, non-behavioral factors, enabling factors, and reinforcing factors. The following chapter is a focused review of the literature, organized according to the conceptual framework of Green and Kreuter (1991). Relevant research to the aforementioned selected portions of the model is outlined.

CHAPTER 2

REVIEW OF THE LITERATURE

Introduction

Information about menopause dates back to prebiblical writings. Early philosophers and scientists made attempts to discover explanations to this event. Suggestions for therapies to alleviate climacteric symptoms began to appear in the medical literature of the late eighteenth century (Utian, Flint, & Kronenberg, 1990). A landmark development was the publication of Robert A. Wilson's book, Feminine Forever, an instant best seller in 1966 that popularized a theory called "estrogen replacement treatment" or hormone replacement therapy (HRT) (Utian et al., 1990). The book empowered women by providing an information source, as well as stimulated physician debate over the issues. This publication resulted in people thinking about and discussing the choices of HRT.

Initially a therapeutic role was established for HRT. Today more emphasis is being placed on the preventative aspects of HRT. Therefore many health care providers are re-examining their HRT treatment methods in climacteric and postmenopausal women. A recent survey (Wilkes & Meade, 1991) was focused on current prescribing practices for hormone replacement therapy among general medical

practitioners. The practitioners were also questioned about their views on the role of hormone replacement therapy in the prevention of osteoporosis and cardiovascular disease. The practitioners were currently prescribing hormone replacement therapy to an estimated 9% of their female patients aged 40 to 64 (Wilkes & Meade). Eighty-five percent of 220 physicians responded to the questionnaire. Wilkes and Meade reported that 55% of physicians surveyed prescribing opposed hormone replacement therapy (i.e., estrogen plus progestogen) to more patients than a year previously. Over half indicated they would consider therapy for prevention of osteoporosis and cardiovascular disease to asymptomatic women. Overall 79% stated they would consider entering their patients into nonrandomized control studies comparing unopposed with opposed hormone replacement therapy. Practitioners still expressed considerable uncertainty about the balance of beneficial and harmful effects of hormone replacement therapy over the long term (Wilkes & Meade).

Osteoporosis and arterial disease are major causes of morbidity and mortality in postmenopausal women, therefore, hormone replacement therapy can make a significant impact in the health of older women. However, there are many variables that mediate and influence the true effects of the climactic and hormone replacement effects. Among these are

dietary patterns, exercise levels, lifestyle (smoking, drugs, alcohol), and concomitant other medications (all drugs, hormones, vitamins).

Health and Non-health Factors

Primary osteoporosis is an age-related disorder and can be defined as "a condition in which bone tissue is reduced in amount, increasing the likelihood of fracture (Peck, Riggs, & Bell, 1987). After men and women reach peak bone mass in the fourth decade of life a slow decline occurs (about 0.5% per year) through at least the eighth decade (Riggs & Melton, 1986). This bone loss accelerates in women to about 2% per year in the first five to seven peri- and postmenopausal years (Riggs & Melton). Lufkin and Ory (1989) categorize osteoporosis as two types: Type I osteoporosis (postmenopausal osteoporosis) is usually manifested within 15 to 20 years of menopause affecting primarily trabecular bone and Type II osteoporosis (senile osteoporosis) affects women over the age of 70 involving the trabecular and cortical bone.

Estrogen replacement therapy has been shown to retard bone loss in postmenopausal women (Gillespy & Gillespy, 1991; Rubin, 1991; Ettinger, Genant, & Cann, 1987). The cellular mechanism of action is not clear. However, it is known that estrogen acts primarily by delaying bone

reabsorption. Many studies have shown that although the femur is a complex combination of trabecular and cortical bone, estrogen is effective in preventing hip fractures (Kiel, Felson, Anderson, Wilson, & Moskowitz, 1987; Naessin, Perssen, Adomi, Bergstrom, & Bergkvist, 1990; Bynny & Speroff, 1990). Hip fractures are a significant problem among women. In 1986, of the 321,909 women hospitalized over the age of 45, with osteoporosis, more than half had sustained hip fractures. Eighty percent occurred in women aged 75 and older (Rubin). The elderly population is living longer especially those 85 years of age and older. Rubin stated that there is an increasingly disproportionate number of women to men within this group. Quigley, Martin, Bernier, and Brooks (1987) report that the positive impact of estrogen replacement therapy on bone has been demonstrated even in women over the age of 65. Some authors believe that this is a strong argument in favor of treating very old women who have never been on estrogen (Bynny & Speroff, 1990) while others suggest caution in the interpretation of results (Whitehead, Godfree, 1992).

The protective mechanisms of estrogen are only sustained while women are on the replacement hormone. Lindsay, MacLean, Kraszewski, Clark, and Garwood (1978) and Horsman, Nordin, and Crilly (1979) stated that in the 3 to 5 year period following loss of estrogen, whether after

menopause or after estrogen therapy, there is an accelerated loss of bone. Wasnich, Yano, and Vogel (1983) reported that based on bone mineral measurement, the positive effect of estrogen is only seen in those under constant therapy. Those who discontinued HRT have a prevalence rate of vertebral osteoporosis much like women who have never been on estrogen therapy. An associated question is, how long one should be placed on estrogen replacement therapy? Because the literature suggests that HRT has an antihypertensive effect and a cardiovascular protective mechanism, it seems that hormone replacement therapy can compare in a favorable way to widely accepted clinical practices (such as prescription drugs to decrease hypertension or lower cholesterol level). It must be noted that this cost effectiveness of hormone replacement therapy can be easily offset by the patients view on the effects of quality of life. An example of such an offset can be adverse patient attitudes towards the progestin-induced menstrual periods. As new data is gathered, it will be necessary to re-evaluate the cost-effectiveness in all options, but especially on the effects estrogen replacement therapy has on heart disease, the leading cause of death in both women and men.

An immediate rise in risk of heart disease is not caused by natural menopause. However, this is a period of

increasing risk of heart disease with age and estrogen deficiency being the probable cause. Most of the literature strongly supports a protective effect on the cardiovascular systems of women taking estrogen replacement therapy (Sitruk-Ware, 1990; Bush, Miller, Criqui & Barrett-Conner, 1990; Gruchow, Anderson, Barboriak, & Sobocinski, 1988). Sullivan et al., (1988) compared postmenopausal women taking HRT with postmenopausal women not taking HRT undergoing coronary arteriography and found an overall 56% reduction in risk of coronary disease in estrogen users (after adjustments were made for age, cigarette smoking, diabetes, cholesterol, and hypertension). Even women over the age of 70 demonstrated a 44% reduction in risk (Sullivan et al., 1988). The estrogen protective effect is achieved by specific pharmacologic consequences. Bynny and Speroff (1990) reported that approximately 75% of the overall reduction in mortality in estrogen ever-users was due to protection against heart disease. The protective mechanism most apparent is the change estrogen has on lipoprotein levels.

Cholesterol carrying lipoprotein in the blood affects the risk of cardiovascular disease. The low-density lipoprotein or LDL-cholesterol is the fracture which is most atherogenic. Bynny and Speroff (1990) state that particularly in older people, an inverse relationship exists

between the high-density lipoprotein (HDL-cholesterol) and coronary mortality. Serum lipid patterns improve with most types of estrogen use, primarily by a reduction in the cholesterol and low-density lipoprotein (LDL) cholesterol with an increase in high-density lipoprotein (LDL) cholesterol, thus improving the LDL/HDL ratio (Gambrell & Teran, 1991; Jensen, Nilas, & Christiansen, 1990; Sherwin, Gelfand, Schucher, & Gabor, 1987). The effects of estrogen therapy on the lipid profile is only maintained as long as women remain on the treatment. Hart, Farish, Fletcher, Howie, and Kitchener (1984) concluded that a higher HDL-cholesterol and lower LDL-cholesterol have been seen to persist through at least 10 years of postmenopausal treatment.

The public health benefit of estrogen replacement on cardiovascular disease is enormous. Therefore, a question that must be answered is, what is the effect of monthly progestin on the lipid profile and cardiovascular disease? A review of the literature suggests that a dose-response relationship exists between progestin and the effect on the lipoprotein. Research indicates that both daily, small doses of progestin, and/or higher doses of progestin for 10 days/month maintains a favorable lipoprotein profile (Wren & Garrett, 1985). Barrett-Connor, Wingard, and Criqui (1989) studied adult residents of Rancho Bernardo, California.

They reported that the women using both estrogen and progestin demonstrated the same favorable impact on cardiovascular risk factors as estrogen-only users, when compared to the non-users. Byyny and Speroff (1990) indicated that until the gold standard (i.e. a randomized clinical trial) is done, women receiving estrogen-progestin replacement therapy should have their cholesterol-lipoprotein profile measured on an annual basis. Thus far, it has been found indicating that estrogen-progestin users are able to maintain favorable levels of cholesterol, LDL-cholesterol, and HDL-cholesterol (Byyny & Speroff).

Despite numerous studies in the safety of estrogen replacement, there is still considerable controversy regarding the problems of estrogen-progestin therapy. The increased risk of thromboembolism, hypertension, and altered carbohydrate metabolism is well documented with the use of high dose oral contraceptives (Byyny & Speroff, 1990). Byyny and Speroff stated that these metabolic effects are not seen in postmenopausal therapy because of the lower dosage in a hormone replacement program. Lufkin and Ory (1989) report that there are contraindications such as a history of breast or endometrial cancer, history of cystic mastitis, migraine headaches, and thromboembolic disease. Byyny and Speroff supported these contraindications and

include those women with chronic impaired liver function, seizure disorders, and familiar hyperplasia.

Another health factor to be considered in the use of hormone replacement therapy is a history of gallstones. It has been shown that oral natural estrogens can cause a change in the composition of bile which may lead to an increase in risk of gallstones (Whitehead & Godfree, 1992). Caution should be used when prescribing therapy with those women known to have gallstones or gall bladder disease. Whitehead and Godfree state that after a women has been treated for her gallstones she may use hormone replacement therapy again.

Paganini-Hill, Ross, and Henderson (1988) performed a prospective cohort study and found that estrogen replacement was associated with a 46% overall reduction in the risk of death from stroke, with a 79% reduction in recent users. These results were similar to that observed in this same population for estrogen protection against death due to myocardial infarction deaths (Paganini-Hill et al.). Byyny and Speroff (1990) believed that this protective mechanism is more than the estrogen impact on the cholesterol-lipoprotein profile and probably multiple effects are more likely.

Hypertension is a common problem in older people and a significant risk factor for cardiovascular mortality. In

general, hypertension is not considered a contraindication to hormone replacement therapy, (Bynny & Speroff, 1990). Hassager and Christiansen (1988) report a small, but statistically significant decrease in blood pressure due to estrogen treatment. This has been seen in both normotensive and hypertensive women. The impact of the additional progestational agent on the blood pressure is still unknown, although studies thus far show no effect. Therefore, current practice is guided by these studies and long-term documentation and research is needed for follow-up care.

Venous thrombosis is thought to be a risk of estrogen replacement therapy by many physicians. However, epidemiologic data have failed to support this association (Devon, Barrett-Connor, Renvall, Feigal, & Ramsdel, 1992). Much of the controversy seems to be due to the misunderstanding relative to HRT and oral contraceptives. Oral contraceptives continually are equated with postmenopausal replacement therapy. Yet the doses and types of estrogen are widely different. Mashchak, Lobo, and Dozono-Fakano (1982), report that there is at least a 200-fold difference in potency between the native estrogens found in oral contraceptives and the replacement doses of estrogens. The combination replacement therapy using Premarin, has not increased the procoagulant factors (Lobo, 1992).

Presently there is no data to report that one form of estrogen is better than another. Rather, it is more important to focus treatment on the correct duration, dose, and the presence or absence of a progestin. Genant, Cann, Ettinger, and Gordan (1982) reported that the dose of estrogen which is effective in maintaining the axial and peripheral bone mass is equivalent to 0.625 mg conjugated estrogens. The available commercial estrogens vary in their potency factors which become important when prescribing estrogen.

There are currently two general methods of estrogen replacement therapy. Bynny and Speroff (1990) give the first sequential method as the administration of estrogens from the 1st through the 25th of each month (as a convenient way to remember the routine) then for the last 10 days of estrogen administration a daily dose of 10 mg of medroxyprogesterone acetate is added. The more popular European method is estrogen delivery everyday throughout the month and the progestational agent given daily for the first 14 days of the month. Some women develop unwanted side effects with this dose of progestin, therefore a lower dose (5 mg) may be necessary to solve the problems of weight gain, breast tenderness, and/or depression. This lower dosage is also known to lower the target tissue content of the endometrium estrogen receptors in some studies.

However, most women on this dosage and on the standard sequential regimen experience withdrawal menstrual bleeding. One approach for this problem has been the reduced daily dose of estrogen.

The women without a uterus often are not seen as needing a cyclic progestin in their regimen, yet given the possible impact on the breast it can be considered. The dose of estrogen will differ in the early climacteric and late climacteric because the amount of endogenous estrogen in each phase is different. To date there are no studies that have reported estrogen utilization in very old women i.e. over the age of 85 years.

Behavioral Factors

Among the factors related to bone loss in aging woman are level of physical activity, smoking pattern, and estrogen and calcium levels. Estrogen deficiency is the major component in the bone loss (Gillespy & Gillespy, 1991; Byyny & Speroff, 1990; Rubin, 1991).

As reported earlier, cigarette smoking is associated with an earlier menopause and an increased risk of osteoporosis. Whitehead and Godfree (1992) cite only two variables that appear to play a significant role in the determination of age at menopause: altitude and cigarette smoking, are both found to accelerate menopausal age.

Jensen, Christiansen, and Rodbro (1985) concluded that smoking increases liver metabolism of estrogen. Estrogen blood levels are lower in smokers who are on estrogen when compared to nonsmokers. Michnovicz, Hershcopf, Naganuma, Bradlow, and Fishman (1986) demonstrated that smoking exerts a dynamic inducing effect on the 2 hydroxylation pathway of estradiol metabolism leading to decreased bio-availability at estrogen target tissues. The benefits of estrogen replacement therapy on osteoporosis and cardiovascular disease risk may be reduced in the cigarette smoker.

Kaplan, Casperson, and Powell (1989) reported evidence that physical activity and physical fitness are directly involved in decreased risk of a number of common diseases: coronary heart disease, stroke, hypertension, obesity, diabetes, colon cancer and depression in men. Similar evidence was seen in an 8 year study of women (Blair et al., 1989). Despite this information, Notelovitz (1989) believed that postmenopausal women are not yet benefiting from exercise for two reasons: (1) A decline of physical activity at work and at home from increasing automation and (2) the fact that health care professionals themselves are not physically active and do not prescribe exercise for their patients. The role of exercise in the prevention of both cardiovascular disease and osteoporosis needs to be discussed as both are the main potential adverse

consequences of menopause and the main indication for greater than 10 year use of estrogen replacement therapy.

Exercise has a beneficial effect on the lipoprotein HDL cholesterol (Haskell, 1984). Postmenopausal women who participate in regular endurance exercise have higher HDL cholesterol levels than do inactive women (Moore, Hartung, & Mitchell, 1983). Notelovitz (1989) states that exercise will improve the cardioprotective HDL cholesterol level only after at least 4 months of strenuous activity e.g. running 10 to 15 miles per week. At least 3 months of more moderate activity e.g. walking 30 miles per week can also increase the HDL significantly (Wood & Haskell, 1979). Several studies completed on elderly women show that it is never too late to start a program of exercise and the benefits can include a sense of wellbeing, higher HDL cholesterol levels, increased endurance of exercise, and an increase in maximal oxygen consumption (Cowan & Gregory, 1985).

Physical activity (weight-bearing), as little as 30 minutes a day, 3 times a week, can increase the bone mineral content of bone in older women (Dalsky et al., 1988; Frost, 1989). Both male and female athletes have been shown to have greater bone mass than those similar individuals leading more sedentary lifestyles. However, the beneficial effects of exercise are not sufficient to overcome the harmful effects of estrogen deprivation in athletes who

become amenorrheic (Cann, Martin, Genant & Jaffe, 1984; Drinkwater et al., 1984). Most studies indicate that prolonged benefit from exercise must come from a life-long exercise program and that exercise, by itself, is not as effective as estrogen use at preventing postmenopausal bone loss.

Estrogen replacement therapy slows the rate of bone loss in postmenopausal women, but it does not increase bone mass (Lufkin & Ory, 1989). Exercise stimulates the growth of bone mineral content. Therefore, exercise benefits the individual in many ways. A reduction of various cancers, obesity, and other disease entities has been found in athletes vs non-athletes (Blair et al., (189). Athletes as a group also tend to have less fat in their diets. Exercise together with an appropriate lifestyle and nutritional factors might be considered a useful additive if not an alternative in some instances, to estrogen replacement therapy.

A high-calcium diet has been widely recommended to protect against postmenopausal bone loss and fracture, but its effectiveness remains to be substantiated. Bynny and Speroff (1990) in doing an analysis of the aging women's calcium needs found that in order to remain in zero calcium balance, women on estrogen replacement require a total of 1,000 milligrams elemental calcium per day. The average

women consumes about 500 milligrams of calcium in her diet, the minimal daily supplement equals an additional 500 milligrams and women not on estrogen replacement will require a supplement of 1,000 milligrams a day (Byyny & Speroff). In the absence of estrogen, there is significant impairment of calcium absorption, with nearly 40% of postmenopausal women having inefficient absorption (Heaney, 1989; Recker, 1985). Therefore, calcium absorption is improved with estrogen and makes the utilization of supplemental 500 mg daily calcium possible without the common side effects of constipation and flatulence as with higher doses. This makes for better compliance as well. When compounded over many years even a minor degree of calcium imbalance may have a significant impact on bone mass. Heaney (1989) reported on a simulated model of the contribution of aging - related bone loss, estrogen deficiency, and a negative calcium balance and found that a 10 mg daily calcium loss accounted for nearly one third of all bone mass loss by age 75 and produced nearly 80% as much bone loss as estrogen deficiency.

As with many nutrients the best source of calcium is dietary. If calcium supplementation is necessary, chewable tablets enhance absorption. The elderly women with decreased gastric acid production should use another supplement other than the calcium carbonate due to the

minimal fasting absorption (Recker, 1985). There are several calcium supplements on the market. Calcium carbonate, calcium lactate, and calcium gluconate are the three most common compounds found in a supplement (Byyny & Speroff, 1990). The cheapest and the one with the most elemental calcium (40%) is calcium-carbonate (Byyny & Speroff). The aluminum-containing antacids such as Maalox, Mylanta, and Riopan should be avoided as they can inhibit gastrointestinal absorption of calcium.

It is usually not recommended to prescribe vitamins D with calcium. The vitamin D received from day to day sun exposure and a balanced diet assures most adults adequate Vitamin D nutrition. Ettinger et al., (1987) reported clinical trials of calcium with and without vitamin D did not show an added effect with Vitamin D intoxication, which can be a dangerous, potentially fatal disorder. Calcium plays an important role in the diet of older women, yet calcium replacement cannot totally substitute for the effectiveness of estrogen by compensating with supplemental calcium doses. In the absence of estrogen, calcium, even in supplemental doses of 2000 mg/day, has only minor impact on trabecular and compact bone (MacIntyre et al., 1988). Therefore, minimal calcium supplementation is needed in combination with estrogen replacement therapy.

It is estimated that many thousand women will die of cervical cancer in the United States or be diagnosed with invasive cervical cancer. Celentano, Shapiro, and Weisman (1982) found that many of these cases result from the fact that elderly women are inadequately screened for carcinoma of the cervix. Many factors contribute to the problem such as patient knowledge deficit, physicians not feeling proficient in performing necessary testing and/or laboratory inefficiency. There are several principal risk factors considered in cervical cancer and women over the age of 50 are a primary risk group. The current guidelines recommended by the American Cancer Society are screening initiated at the initiation of sexual intercourse, PAP test every 3 years after obtaining two annual negative smears; and after age 65 screening can be discontinued. It is important to remember that these guidelines are for low risk women and annual exams/smears are recommended for those as high risk. These guidelines continue to be important when treating the elderly women. It is necessary to determine if an elderly women has ever had a PAP test and also if she has had two annual negative readings in the past. A large proportion of elderly women either have not had a PAP test (20%) or have not been adequately screened according to American Cancer Society guidelines (Celentano et al., 1982). In an investigation of 1,580 elderly women in one ambulatory

care clinic, approximately 35% had no prior PAP screen, most had sporadic screening histories, and they had a much higher positive smear rate than found in general population (Mandelblatt, Gopaul, & Wistreich 1986).

Retrospective studies have shown an increased risk of endometrial cancer in women on unopposed estrogen replacement therapy. However, this risk can be reduced by the addition of a progestational agent to the treatment (Figueroa-Casas & Schlaen, 1988; Byyny & Speroff, 1990). Estrogen promotes the growth of endometrium whereas progestin inhibit that growth. Reports show that added progestin both reverses hyperlasion and diminishes the incidence of endometrial cancer (Persson et al., 1989). The critical variable in the protective action of the progestational agents is time, as a required amount of time is needed in order for maximal effect to be reached. The number of days for progestin administration that appears to be optimal is controversial. The arguments are for the addition of a progestational agent ranging from the last 10 to 12 or 14 days of estrogen exposure. Unfortunately to date there is not clinical data to resolve this debate. However, one London study does support 10 days as minimal requirement for monthly progestational exposure, reporting not one women who received 10 or more days of progestin had developed hyperplasia, adenomatous hyperplasia or cancer in 398 women

over a 9 year period (Varma, 1985). Figueroa-Casas and Schlaen (1988) found that providing estrogen replacement to women who had completed therapy for all grades of stage I endometrial disease did not show an increased risk of reoccurrence. It would appear then that the method of choice in estrogen replacement therapy would be a combined treatment with a progestational agent.

The statistics of female breast cancer are alarming and, therefore, women fear breast cancer more than any other malignancy. In America, breast cancer is the leading type of cancer in women (28%), causing 18% of all female cancer deaths in the United States, about 10 times the number of deaths from endometrial cancer (Byyny & Speroff, 1990). Gambrell (1988) reports that the frequency of breast cancer increases throughout the female life span. The sharpest increase in the frequency of breast cancer occurs just prior to menopause and the incidence continues to rise throughout the postmenopausal years when estrogen levels are lower.

Factors that prolong the overall accumulation of estrogen unopposed such as low parity, first childbirth after age 30, obesity, ovulation, early menstrual, and late menopause will increase the relative risk of breast cancer (Byyny & Speroff).

Numerous studies on estrogen replacement therapy have failed to prove the use of exogenous estrogens as a cause of breast cancer in postmenopausal women (Gambrell, 1987). Byyny and Speroff (1990) supported a prospective cohort study and two large case-control studies that also do not show an increased risk for breast cancer in the use of estrogen in the postmenopausal woman and feel that these studies are large enough to have reliable results in various categories. More recently an Australian study controlling for secular trends in estrogen use, type of menopause, and duration of estrogen use had the same conclusion (Roham & McMichael, 1988). Armstrong (1988) did an analysis of 23 studies of estrogen use and concluded "unequivocally" that estrogen use did not alter the risk of breast cancer. However, there are studies that support that just the opposite is true. For example, a recent prospective study in Sweden showed a significant trend of increasing breast cancer risk with increasing months of unopposed estrogen use (Bergkvist, Hans-Olov, Persson, Hoover, & Schairer, 1989). Results from this study can be interpreted in two ways.

Bynny and Speroff (1990) reported that besides method problems the study was not statistically significant. The authors of the study reported that although the number of long-term users of combined therapy was limited, the study still supports the hypothesis that estrogen plus progestin would have an adverse effect on breast epithelium. To conclude, there is a considerable amount of inconsistency in the opinions of the effects of menopause estrogen therapy on the risk of breast cancer. Further assessments are necessary in order to complete the information base on the risks of breast cancer associated with the combined estrogen progestin menopausal estrogen therapy.

The early detection of breast cancer is the surest way to improve the prognosis. There are a number of simple preventative procedures for women to abide by. The American Cancer Society has recommended the following as cancer screening guidelines for normal palpable breasts with no risks: (Gambrell, 1988)

- baseline mammogram between ages 35 - 40
- mammogram every 2 years between ages 40 and 50, and
- annual mammogram after 50

Women with history of major risk factors for breast cancer may need more frequent mammograms (Bland, 1987). It has been estimated that most carcinomas of the breast have been present up to 7 years before diagnosis and, therefore,

improved methods of detection should decrease the delay preventing the necessity for radical methods of therapy. For example, a mammogram will pick up suspicious areas before they are clinically palpable.

Self-examination of the breast should be taught to patients, since 84% of malignancies are first found by the women herself (Gambrell, 1988). Today there are many aids such as videotapes, films, and pamphlets for the busy practitioner to utilize in teaching. Along with self-examination, patients should be encouraged to have breast examinations annually especially after the age of 35.

Gambrell (1987) states that several studies on estrogen replacement therapy have not supported the fact that exogenous estrogen use causes breast cancer. In fact, many other researchers support that the added progestogen decreases the risk of breast cancer in some women (Nachtigall, Nachtigall, & Nachtigall, 1979; Lauritzen & Meier, 1984). There was noticeable lower incidence of breast carcinoma in these studies in estrogen-progestogen users as compared to the non-users.

The symptoms of estrogen deficiency are not experienced by all postmenopausal women. Some women have the problem of excess estrogen by the presence of uterine bleeding. In younger years this dysfunctional uterine bleeding is usually found to be tissue displaying estrogen effects unopposed by

progesterone. In the premenopausal women this is due to anovulation and in the postmenopausal women this is due from extragenital endogenous estrogen production or estrogen administration (Odom et al., 1990). The cause of the increase in endogenous estrogen levels in the postmenopausal women should be diagnosed. Endocrine tumors, liver disease, stress, obesity, hyperthyroidism, ovarian tumors, and decreased level of sex hormone-binding globulin (SHBG) leading to increased levels of estrogen in the body are necessary to rule in or out as the cause (Odom et al., 1990). Over 90% of cases of hyperplastic changes and irregular bleeding are reversed and controlled with added monthly progestin therapy.

Non-Behavioral Factors

The non-behavioral factor to be explored in this study is age. Next to chronological age, gender is the next most important predictor of mortality. On average women live 8 years longer than men. In a 1986 census there were 90% more women in the over-65 age group as a whole and more than twice as many women in the over-85 age group (U.S. Bureau of Census, 1987). Although women live longer they also tend to have somewhat greater disability than older men and about the same burden of chronic illness and conditions (Bush et al., 1990).

It is known that the life expectancy of women is extending for many years past the climacteric. This transitional, period of a women's life brings many characteristic changes that need to be studied. These changes are primarily caused by decreased ovarian estrogen secretion. With the decreased secretion of 17P-estradiol in the postmenopausal women comes the decrease in weight and size of the organs of the female genitourinary tract and the breasts (Odom et al., 1990). Other known physiological changes include: atrophic endometrium, atrophy of all muscle surface that is accompanied with vaginitis, pruritus, dyspareunia, and stenosis. Many of these atrophic changes then lead to a class of symptoms which may affect the ease and quality of living. Unless there are masking dermatologic conditions present, estrogen therapy is used successfully in the relief of these atrophic problems.

Older women experience a decreased and a delay of vaginal lubricant in response to sexual stimulation which may cause dyspareunia. Again this is another factor in the decreased estrogen production phase of an elderly woman. Semmens and Wagner (1985) report objective measurements have demonstrated that vaginal factors which influence the enjoyment of sexual intercourse can be maintained by appropriate doses of estrogen. An immediate response is not always the outcome, however this should not discourage the

patient. The therapeutic effects of estrogen can be complimented with sexual activity, as it supports the circulatory response of the vaginal tissues.

The menopause syndrome and the effects of estrogen therapy on the symptoms is still uncertain. Symptoms of this syndrome are thought to be depression, anxiety, fatigue, and irritability. Campbell and Whitehead (1977) reported that many automatic 'improvements' due to the estrogen therapy were a dominate effect from the relief of the hot flashes. Therefore, these symptoms are not considered estrogen related causes. It is also believed that the reduction of hot flashes during sleep promotes an improvement in quality of sleep and a reduction of chronic sleep disturbances (Campbell & Whitehead).

Enabling Factors

The final category in Green's model that will be addressed is enabling factors. The three variables to be discussed are: education, income, and utilization of health care services. The elderly may be given plenty of opportunities to enjoy a wide variety of health promotion activities, yet they need the skills and knowledge to take advantage of them. Societies have differential treatment given to various categories of people, these social inequalities are passed on from one generation to the next.

To a great extent, the experience of aging is influenced by these societal limitations. The socioeconomic status of an elderly persons often defines past and present education, income, and utilization of health care services.

There are no clearly defined points that separate social classes in American society. The terms upper, middle, or lower class refer to stereotyped composites of lifestyles, educational background, family values, income, housing, and occupations (Atchley, 1980). It is possible to discuss general categories realizing the boundaries are not binding.

Upper-class people have access to wealth and power. This privileged position often is accompanied by better health and much less likelihood of facing dependency in old age (Atchley, 1980). The middle class in America is very large and consists of well-educated white-collar workers that have good health and adequate financial resources in retirement. Social class has often been used as a variable in gerontological research. Atchley reports that studies of retirement, adaptation to aging, and numerous other topics have found that social class makes a difference. For example, compared to the working class and the poor, the middle class enters later life with better health, more financial resources, more activities, better housing, and fewer worries (Atchley).

One's values, attitudes, life style, and opportunities are influenced by the social class in which they associate with. The enabling factors of education and income will affect a person's health behaviors and financial resources with which they approach later life. Less education also usually means fewer skills for enjoying life off the job (Atchley, 1980).

The third enabling factor in Green's model is the utilization of health care services. Access to medical care, including preventative screening for early detection and treatment for diagnoses, is a determinant to life span and good health. Likewise, lack of health insurance is a major barrier to health care. A 1990 report showed that the uninsured Americans were 37 percent less likely than the insured to use physician services, and 69 percent less likely to be hospitalized (Naierman et al., 1992).

In total, 3.7 million American women over age 45 have no health insurance (Naierman et al., 1992). Barriers to health insurance coverage for women are: part-time employment, caregiving responsibilities, and poor benefits offered by the jobs most often held by older women. Another major problem for older women is that private health insurance is costly and has limited coverage for preventative services. According to a 1992 report, only eight states require private insurers to cover mammograms

and Pap smears (Naierman et al., 1992). Similarly, screening services for older women are generally not covered by medicaid programs. Health care behaviors and practices are obviously influenced by health insurance coverage.

Summary

The literature review revealed that osteoporosis and arterial disease are the major causes of morbidity and mortality in postmenopausal women. The woman's incidence of cardiovascular disease fast approaches that of men at age 80. The medical care cost in the treatment and support of menopausal symptoms, osteoporotic fractures, and cardiovascular disease is significantly high. Research has shown that estrogen replacement therapy can retard bone loss in postmenopausal women, has a protective effect against heart disease due to lowering lipid levels, and can give relief of vasomotor instability. Therefore, estrogen replacement can make a significant impact in the arena of women's health care and cost.

The positive aspects of estrogen therapy are often overlooked due to the concern of risks such as cancer. However, many other variables can have an impact on the overall outcome of estrogen replacement therapy. Nutritional dietary patterns, exercise levels, lifestyle

(smoking, drugs, use of medical services), medications, and disease history are variables that can mediate the outcome.

The choice of estrogen replacement therapy can be made only after these variables have been examined. Therefore our research base will need to be expanded to include them and, thus, the purpose of this study.

CHAPTER 3

METHODOLOGY

Introduction

The purpose of this study was to describe the profile of older, middle-income women, on estrogen replacement therapy. A second purpose was to identify: (1) most commonly prescribed estrogen replacement therapy, and (2) health promotion behaviors practiced by this group of women. It is hoped that a better understanding of estrogen replacement therapy will assist clinicians, particularly nurse practitioners, with making decisions about this treatment option. The study was organized according to Green's Health Care Model and the design of the study was descriptive survey.

Setting and Sample

The setting for this research was a retirement community located in the southwestern part of the United States. A health fair conducted by the University of Arizona's Health Science Center included extensive assessment of health status and feedback regarding results, counseling and/or referral related to findings. The feedback

of results included percent body fat, blood cholesterol levels, blood pressure and urine analysis.

The sample of subjects in this study were older, retired women living in the middle to upper income retirement community. The total number of women screened during the health fair was 334. Of these, a subset of 48 women was selected for this investigation. The selection criterion for the subset was that the women reported prescription use of some form of estrogen therapy.

Protection of Human Subjects

Prior to initiation of the Green Valley Health Expo, 1991, Human Subjects approval was received from the Human Subjects committee of the University of Arizona. The study was given exempt status, therefore a disclaimer preceded statements on the questionnaire (Appendix A). Willingness to respond to the questions indicated consent.

Procedures

A packet containing multiple questions about health and health lifestyle was mailed to participants prior to collecting physical health measures at the Health Fair. Participants brought completed questionnaires with them to the screening site. Name matched coded identification numbers were assigned to all questionnaires and only the

principal investigator and research assistant for the medical group had access to names and numbers. This was done to assure confidentiality of data beyond the health fair. Both qualitative and quantitative data were collected. Data collection was completed during the course of health screening by numerous health professionals. The investigator had access to aggregate data from the health fair.

Information about the type of estrogen being prescribed and taken was gathered as qualitative data (Appendix B). The data were categorized into derivatives of estrogen, or estrogen plus progesterone. Quantitative data included age, level of educational, smoking history, fat intake, activity level, cardiovascular, arthritis, and osteoarthritis disease profiles, cholesterol level, health promotion behaviors including self breast exam, mammography, and papanicolaou smears and source of medical care. Questions excerpted from the total questionnaire are outlined in Appendix C. Variables in the study were organized according to the theoretical model of Green and Kreuter (1991) (Figure 2).

Validity for developing this survey data was established by face validity. Medical and nursing professionals read the questionnaire to evaluate if the questions would capture the needed data. The questionnaire was constructed for this study and studies involving

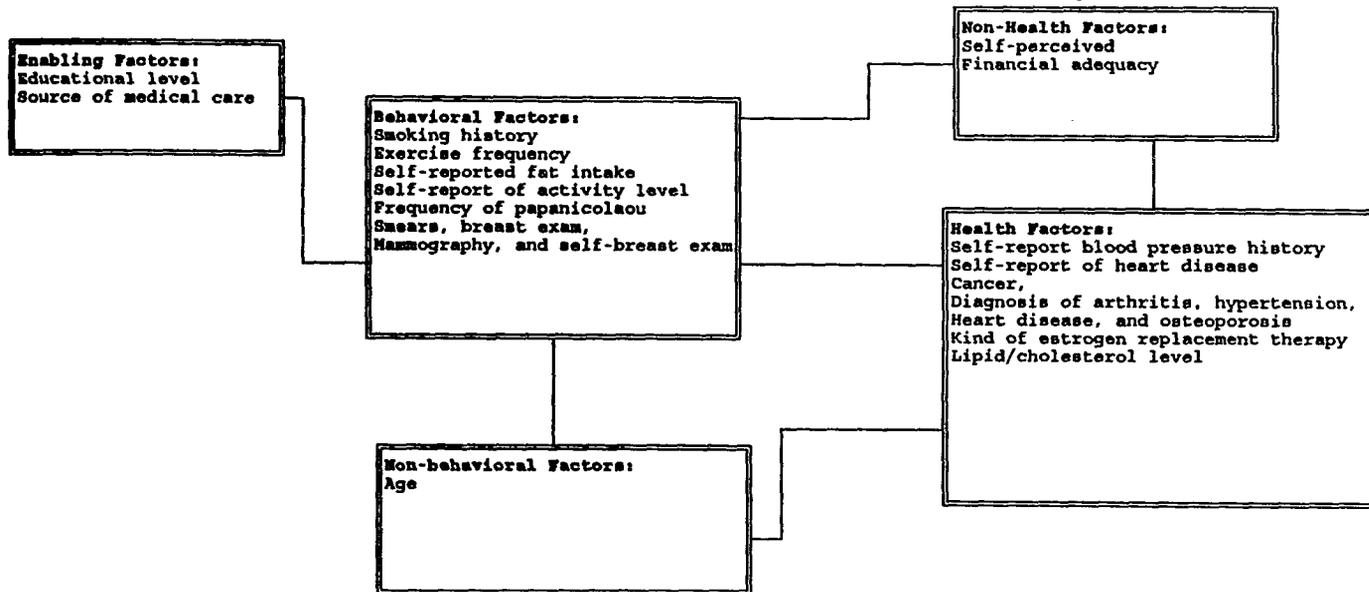


Figure 2. Application of Theoretical model to selected study variables.

cardiovascular disease and gero-psychiatric issues, thus there is no established reliability to report. For this study, there were several standard instruments used in assessing the older population, such as the Geriatric Depression Scale. The health history questionnaire was untested and was used for a number of research projects. Participants completed their own questionnaires. Clinical data such as laboratory results met usual standards for calibration and analysis of results.

Data Analysis

Descriptive data analysis was done by evaluating measures of central tendency and dispersions including mean, median, mode, frequency distributions and standard deviation. Pearson's product moment correlation was computed to assess relationships between self-reported dietary fat intake and total blood cholesterol level.

Summary

Within this chapter, the research design, sample/setting, and procedures were discussed. The data analysis was explained by detailing the evaluation measures used.

CHAPTER 4

RESULTS

Introduction

This chapter presents the findings of the study based on the research questions. These include descriptive and correlational analyses. Data are interpreted and presented narratively, and when useful to illustrate trends, tables have been employed.

Description of the Sample

The sample size was 48 females (Table 1). Ages ranged from 49 to 75 years with a mean age of 65 years and a standard deviation of 6.68 years. Sixteen of the subjects were High School Graduates (33%), five had completed Vocational/Technical School (10%), eleven were college graduates (23%), seven had completed some graduate course work (15%), and nine had Master's Degrees (19%).

Research Question One

The first research question was: What is the subject profile for age, educational level, smoking history, fat

Table 1

Demographic Data of Sample (N = 48)

Subject	Frequency	Percentage
Gender		
Female	48	100
Age		
49 to 60	12	25
61 to 70	25	52
71 to 75	11	23
Educational level		
High School Graduates	16	33
Vocational Technical	5	10
College Graduates	11	23
Graduate School Work	7	15
Masters Degree	9	19

intake, activity level, cardiovascular, arthritis, and osteoarthritis disease profile, cholesterol level and source of medical care of older, middle-income women who are on estrogen replacement therapy?

Descriptive data included a frequency count, frequency distribution and percent (Table 2). Data indicated that the majority of subjects (n=25) did not smoke, limited fat intake (n=42), participated in vigorous recreational activities two or more times a week (n=41), did not have heart disease (n=45) or high blood pressure (n=31), used a private physician for medical care (n=43), and indicated their financial status was adequate (n=48). Further findings were that 50% of the sample had arthritis, 20% had osteoporosis and 12.5% had hypertension (Table 2).

Total cholesterol levels ranged from 167 to 312 with a mean of 225 (Table 3). The low-density lipoprotein (LDL-Cholesterol) ranged from 71 to 203 with a mean of 122 and the high-density lipoprotein (HDL-cholesterol) ranged from 46 - 125 with a mean of 74. The triglyceride range was from 53 - 340 with a mean of 143.

Table 2

Profile Characteristics of Sample (N = 48)

Subject	Frequency	Percentage
<u>Smoking History</u>		
No, I never have or have only tried it	25	52.1
No, I smoked in the past and quit	22	45.8
Yes, I smoke less than 10 cigarettes a day	1	2.1
<u>Fat intake</u>		
Do you limit foods high in fat?		
Yes	42	87.5
No	6	12.5
<u>Activity Level</u>		
How often do you participate in vigorous recreational activities?		
Daily	11	22.9
Three or more times a week	16	33.3
One or two times a week	14	29.2
Rarely or never	7	14.6
<u>Heart Disease</u>		
Do you have?		
Yes	3	6.3
No	45	93.8
<u>Arthritis</u>		
Do you have?		
Yes	24	50.0
No	24	50.0
<u>Osteoporosis</u>		
Do you have?		
Yes	10	20.8
No	32	66.7
<u>Blood Pressure</u>		
Normal (no treatment)	31	64.6
Normal (following treatment)	11	22.9
Borderline	5	10.4
High	1	2.1
<u>Source of Medical Care</u>		
Private	43	89.6
HMO	1	2.1
ER	0	0.0
Clinic	1	2.1
None	3	6.3
<u>Financial Status</u>		
Describe: "I have enough to get by"		
yes	48	100.0
no	0	0.0

Table 3

Total Cholesterol Levels (N = 48)

	Sample Ranges	Mean	Median	Mode	SD
Total Cholesterol	167 - 312	224.8	218.5	197	35.4
Triglycerides	53 - 340	142.8	130	95	61.2
HDL	46 - 125	74.0	70.5	56	17.2
LDL	71 - 203	121.7	124	71	28.6

Research Question Two

The second research question was: What types of estrogen replacement therapy are prescribed and which type is most often prescribed? The types of estrogen replacement therapy are listed in Table 3. The most commonly prescribed therapy was Premarin ($n = 25$), an estrogen replacement medication. Several types of estrogen replacement therapy were reported, 11 in all. The second most common type of therapy was provera and premarin ($n = 10$). One woman simply reported hormone replacement without being specific as to type.

Research Question Three

The third research question was: Do women on estrogen replacement therapy engage in health promotion behaviors of breast self-exam, mammography, and papanicolaou smears? Table 4 illustrates these data. Nearly 92% ($n = 44$) have had a breast examination and mammogram, by a professional, over the past year and seven (14.6%) of the women indicated that they did not do breast self exams (Table 5). Twenty-eight (58%) do a breast exam occasionally. Approximately 85% ($n = 41$) of the women in this sample have had a papanicolaou smear over the past two years.

Table 4

Types of Estrogen Replacement Therapy Prescribed (N = 48)

Estrogens Prescribed	Estrogen derivative	Added progesterone	Frequency
1. premarin	x		25
2. provera and premarin		x	10
3. estraderm and provera		x	3
4. estrovis	x		2
5. estrace	x		2
6. estratest	x		1
7. estraderm	x		1
8. estrogen replacement	x		1
9. conjugated estrogen	x		1
10. conjugated estrogen and medroxyprogesterone		x	1
11. hormone replacement			<u>1</u>

Table 5

Health Promotion Behaviors (N = 48)

Subject	Frequency	Percentage
<u>Pap test</u>		
Have you had in the past two years?		
yes	41	85.4
no	7	14.6
<u>Breast examination</u>		
Have you had a breast examination and mammogram in the past year?		
yes	44	91.7
no	4	8.3
<u>breast self-exam</u>		
no	7	14.6
yes, occasionally	28	58.3
yes, at least monthly	13	27.1

Research Question Four

The fourth research question for this study was: What is the relationships between self-reported limitation of fat intake and blood cholesterol level? The relationship between the self-reported limitation of dietary fat intake and total blood cholesterol level was not significant ($r = .0329$).

Summary

The results of data analysis were presented in this chapter. The demographic characteristics of the sample were outlined. Descriptive statistics were used to present profile characteristics of the sample. The sample consisted of approximately 53% with no smoking history, 88% limiting their fat intake, 23% participating in vigorous daily recreational activity, 94% without heart disease, 90% with a source of medical care, and 100% reporting financial adequacy. Pearson's product moment correlation coefficient was used and revealed no statistically significant relationship between the reported limitations of dietary fat intake and total blood cholesterol level.

CHAPTER 5

DISCUSSION AND CONCLUSIONS

Introduction

The findings associated with the conceptual framework, the profile of one group of older, middle-income women, on estrogen replacement therapy are outlined. A discussion of the findings associated with the conceptual framework, the limitations of the study, implications for nursing practice, and recommendations for further research are presented in this chapter.

Findings Associated with the Conceptual Framework

There are a multitude of factors that may affect the choice of estrogen replacement therapy according to the model of Green and Kreuter (1990). Although the questionnaire did not focus on why or why not the sample selected estrogen treatments, several of the factors found in the literature are identified here. These factors include enabling, behavioral, non-behavioral, health, and non-health factors. Within the model, variables within the factors, may or may not influence other variables within the framework.

Osteoporosis

Data collected in this study indicated that approximately 67% of the sample reported they did not have osteoporosis, or if they did were unaware (health factor). This health factor could be affected by a person's age (non-behavioral factor) and/or decision to use HRT (health factor). The age profile of this sample ranged from 49 - 75 years with a mean age of 65 years. Hazzard et al., (1990) reported that estrogen deficiency in postmenopausal women can increase their risk of osteoporosis. Gillespy and Gillespy (1991) noted that estrogen replacement therapy retards bone loss in postmenopausal women. Based on the literature it is possible that the estrogen users in this study have reduced their risk of osteoporosis despite their age. However, this is only a supposition since bone density measures were not done.

Heart Disease

Agner (1985) reported that the incidence of heart disease increases as women age. Menopause is a period of increasing risk for heart disease with age and estrogen deficiency being the contributing factor. Sitruk-Ware (1990), Bush et al. (1990), and Gruchow et al. (1990), stated that there is a protective effect on the cardiovascular systems of women taking estrogen replacement

therapy, with a reduction in risk by as much as 50%. Approximately 94% of this study sample reported that they do not have heart disease.

Health Maintenance Behaviors

One purpose of this study was to gain information about the characteristics of women who were taking estrogen replacement therapy. Characteristics included health maintenance behaviors and the relationship of those to variables such as income and health insurance coverage, which may promote and enhance wellness practices. One hundred percent of the sample in this study reported adequate financial status. Only 6% reported having no source of medical care. The majority of the sample engaged in the health promotion behaviors of mammography and papanicolaou smears. These results are consistent with research by Atchley (1980) who reported that upper and middle class Americans have better health promoting behaviors. The enabling factor of income, may have affected the health behaviors of women in this study.

Physical Activity

Kaplan et al. (1989), reported that physical activity is directly related to a decreased risk of heart disease. Data analysis indicated that only 85% of the sample

participated in vigorous recreational activities at least one or two times a week. Furthermore, 94% had no heart disease. This would seem to indicate that physical activity may have been an important factor in the reduction of heart disease among women involved in this study.

Cholesterol Level

The health benefit of estrogen replacement therapy on heart disease was previously discussed. Briefly, the protective mechanism attributed to estrogen is related to lipoprotein levels. These include a reduced cholesterol level, reduced low-density lipoprotein (LDL) cholesterol and an increase in high density lipoprotein (HDL) (Gambrell & Teran, 1991). The mean total cholesterol level for the sample in this study was approximately 225. However, no statistically significant relationship was found between self-reported fat intake and total cholesterol level. This finding may be due to: (1) the limitation of self-reporting, (2) small sample size, and (3) lack of knowledge about the sample's education on diet, fat, and cholesterol.

Smoking

Baron (1984), McKinlay et al. (1985), and Odom et al. (1990), reported that smokers experience an earlier spontaneous menopause than do nonsmokers. Jensen et al.,

(1985) reported that estrogen blood levels are lower in smokers who are on estrogen compared to nonsmokers due to increased liver metabolism of estrogen. Therefore, cigarette smoking has an indirect and negative effect on bone structure leading to osteoporosis and cardiovascular disease. In this study 98% reported they never smoked or that they had in the past and quit. However, the survey did not ask the age of menopause, and therefore no assessment was done on the relationship between spontaneous menopause and smoking.

Hormone Replacement Therapy

The most important finding in this study was that only 48 out of the 334 women screened took HRT. Although there are a number of benefits documented in the literature in taking HRT, this study suggests women are not choosing HRT. This could mean that more education is needed on this subject in order for women to make a truly informed decision. This education includes, first, educating health care professionals, such as GNP's. From this finding further research should be pursued into the group of women who are not on HRT. Questions such as: what are their reasons for not taking HRT, what health promotion behaviors do they practice, what are their health risks, and what is their financial adequacy should be explored.

Limitations of the Study

The primary limitations of this study were the small sample size and non-randomized sample selection. The convenience sampling further limited the true cross-section population of the elderly U.S. women. Self-reporting via questionnaire is another limitation of the study because one must assume that reported answers are truthful. Furthermore, the convenience sampling of a middle-income retirement community eliminated a large portion of the elderly population. Another final limitation is the fact that some participants may have not understood the terminology used in the questionnaire and this may have resulted in misinterpretation of the questions, which could have affected the results.

Implications for Nursing Practice

The number of women in the postmenopausal stage of life is increasing. This stage of estrogen deficiency in a woman's life brings significant increased risk of osteoporosis and heart disease. These are costly diseases, financially, as well as, in morbidity and mortality rates.

More research needs to be done in the elderly population to determine the amount of decreased risk of these diseases with estrogen use. For example, how much does HRT reduce the risk of heart disease or osteoporosis as

compared to the variables of diet and exercise in the elderly woman. If repeated research studies show similar results of decreased heart disease in those elderly women taking estrogen, clinical practice might change directions (longer duration of use). Another implication is that adherence to ERT may promote the practice of other health promotion behaviors such as limiting fat intake, regular exercise, no smoking, breast self-examination on a regular basis, mammography, and papanicolaou smear.

There is limited research done about the characteristics of women who are on regimens of HRT in terms of age, co-morbidity profiles, and health maintenance behaviors. There is also scant information about health maintenance behaviors and the relationship of these to the variables, such as income and health insurance coverage which may promote wellness practices. This study was a beginning effort to gain information.

Finally, this study suggested that women with financial adequacy and a regular source of medical care demonstrated better health. However, continued research must be done in order to provide a more guided practice. For example, should HRT be routine preventative health care in the elderly woman, or should it be limited in its use?

Consideration of the variables including age, diet, chronic disease, blood cholesterol levels, medication

profile, self-breast exam, and physical activity should be considered in the total treatment plan. The benefits of estrogen replacement therapy have been reported in regard to the reduction of osteoporosis and heart disease (Lufkin & Ory, 1989; Riis et al., 1987; Ettinger et al., 1985). Yet controversy exists due to the lack of certainty about the variables such as age, risk of breast cancer, risk of osteoporosis, and risk of cardiovascular disease that may effect the choice of estrogen replacement therapy. Therefore client education by health care providers must include the rationale and risk of ERT and the health behavior variables such as limiting fat intake, exercise, and smoking history that may affect the outcome of ERT.

Recommendations for Further Research

Replication of the study with a larger sample size is recommended. Because the study was completed in one residential retirement community, the data may not be representative of the population as a whole. For further study, broadening the sample size is suggested to gain generalizability. This would include women in varying socioeconomic groups. Another recommendation would be further development of instrumentation with established reliability and validity to strengthen generalizability of research in this area. One method may be to be more

specific in the questionnaire. For example, further information that could be gathered includes: (1) patient's knowledge of why she is taking estrogen, the dose she is taking and the duration of use, (2) patient's knowledge of the overall benefits of estrogen replacement therapy and (3) patient's concerns about taking estrogen replacement therapy. A final recommendation is further research into diseases and conditions, such as osteoporosis, heart disease, and breast cancer that primarily affect women. This would include specifically the reduction of osteoporosis and cardiovascular risk in women over the age of 75 on ERT. More long term research on estrogen use greater than ten years duration is needed to guide geriatric practice. There must also be more studies generated in estrogen utilization in the very old women, over the age of 85 years. This research would include the effects of ERT on these disease processes.

Summary

The purpose of this study was to describe the profile of one group of older, middle-income women, on estrogen replacement therapy. Finally, limitations of the study, implications for nursing practice, and recommendations for further research were outlined.

APPENDICES

APPENDIX A -- CONSENT FORM

**GREEN VALLEY
HEALTH EXPO 1991**

Thank you for participating in AHSC's second Health Fair for Green Valley.

Health for the 90's.

This packet consists of several health lifestyle questionnaires. Information from these questionnaires will allow our health professionals to provide you with recommendations which could result in an improved quality of life. Your responses will also assist our researchers in answering questions important to new understanding about health and aging.

Please answer all questions as best you can. A health professional will be available to assist you at your scheduled screening appointment if clarification is needed.

**BRING THE COMPLETED
QUESTIONNAIRES WITH YOU TO YOUR
APPOINTMENT.**

Also included within this packet is an informed consent from which you should read. Sign the form if you are willing to allow your information to be used in research investigations. The assessments being conducted are possible at the limited cost of \$15.00 because of ongoing research at the University of Arizona. As you complete the following questionnaires you may notice some repetition of questions. This is a result of the involvement of several independent health professionals. Please complete each question even if you have answered a similar question previously.

A summary of the results of your questionnaire may be obtained on March 23, 1991 at Canoa Hills Recreation Center at a prescheduled time between 8:30 a.m. and 2:00 p.m. You will be notified prior to March 23 as to when your materials will be available. You will have the opportunity to discuss your results and recommendations with health professionals on that day.

Please complete the following:

Name: _____
 First Middle Last (Maiden)

Address: _____
 Street (Apt. No.) City State Zip

Phone: _____
 Home

Birth Date: _____
 Month Day Year

Today's Date: _____
 Month Day Year

APPENDIX B
MEDICATION AND MEDICAL HISTORY

1. Please list all prescription medications you are currently taking.

<u>Medications</u>	<u>For What Problem</u>

2. Please list any "over-the-counter" drugs or vitamin supplements you are currently taking or occasionally (e.g. Tylenol, cold preparations, vitamin C, etc.)

<u>Medications</u>	<u>For What Problem</u>

3. Have you been told that you have, or are you currently being treated for any of the following medical problems? Please circle each appropriate response and indicate the year of diagnosis (if known).

Hypertension	Yes	No	Year Diagnosed _____
Heart Disease	Yes	No	Year Diagnosed _____
Arthritis	Yes	No	Year Diagnosed _____
Osteoporosis	Yes	No	Year Diagnosed _____

APPENDIX C

DEMOGRAPHIC INFORMATION

3. Check the one category which best describes your educational level.

<input type="checkbox"/>	No education	<input type="checkbox"/>	College Graduate
<input type="checkbox"/>	Some Grade School	<input type="checkbox"/>	Some Graduate School
<input type="checkbox"/>	Completed Grade School	<input type="checkbox"/>	Master's Degree
<input type="checkbox"/>	Some High School	<input type="checkbox"/>	Doctoral Degree
<input type="checkbox"/>	High School Graduate	<input type="checkbox"/>	Postdoctoral Work
<input type="checkbox"/>	Vocational/Technical School		

WELLNESS CHECK

PLEASE CHECK ✓ ONLY ONE ANSWER PER QUESTION AND DON'T SKIP ANY QUESTION.

3. AGE: Write your age here _____ years old
7. Do you limit foods high in fats such as red meats, pork, sausage, butter, whole milk, or cheese?
 ___ yes ___ no
12. How often do you participate in vigorous recreational activities such as dancing, swimming, biking, or energetic walking?
 ___ daily
 ___ three or more times a week
 ___ one or two times a week
 ___ rarely or never
13. Do you smoke cigarettes?
 ___ no, I never have or have only tried it
 ___ no, I smoked in the past and quit
 ___ yes, I smoke less than 10 cigarettes a day
 ___ yes, I smoke 10 or more cigarettes a day
34. Would you describe your blood pressure as:
 ___ normal (and no treatment needed)
 ___ normal (as a result of following treatment)
 ___ borderline
 ___ high
35. What is your regular source of medical care?
 ___ my private physician
 ___ a health maintenance organization (HMO)
 ___ an emergency room
 ___ a clinic
 ___ no regular source of medical care
44. Which of the following best describes your financial situation?
 ___ "I have enough to get by"
 ___ "I can barely make ends meet"
 ___ "I cannot make ends meet"
49. Do you have Heart Disease (such as Angina, Bypass Surgery, Congestive Heart Failure, Heart Attack(s), or similar disease)?
 ___ yes ___ no

ONLY FEMALES ARE TO RESPOND TO QUESTIONS 55, 56 AND 57!!!!

55. FEMALES ONLY: Have you had a Pap test in the past two years?

yes
 no

56. FEMALES ONLY: Have you had a breast examination, including a mammogram, by a professional, in the past year?

yes
 no

57. FEMALES ONLY: Do you do a breast self-exam?

no
 yes, occasionally
 yes, at least monthly

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