

DIET AND LIFESTYLE CHANGES TO MITIGATE MENOPAUSAL SYMPTOMS
A DISSERTATION
PRESENTED TO THE FACULTY
OF HAWTHORN UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF SCIENCE IN HOLISTIC NUTRITION

BY
VICTORIA GOODMAN

JULY 2019

**HAWTHORN UNIVERSITY
WHITEHORN, CALIFORNIA 95589**


DIET AND LIFESTYLE CHANGES TO MITIGATE MENOPAUSAL SYMPTOMS

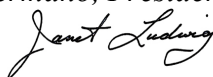
This dissertation is written by:

Victoria Goodman

Submitted to the Faculty of Hawthorn University in partial fulfillment of the requirements for the degree of

**DOCTOR OF SCIENCE IN
HOLISTIC NUTRITION**


Approved by: 
Dr. Dorothy M. Germano, President/Chief Academic Officer


Dr. Janet Ludwig, Director of Doctoral Studies

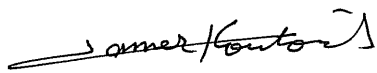
Date: 07/14/2019

We, the undersigned, certify that we have read this dissertation and approve it as adequate in scope and quality for the Doctor of Science

Dissertation Committee:


Dr. Janet Ludwig


Dr. Kirsten Laverdure


Dr. Samer Koutoubi

BIOGRAPHICAL SKETCH

Victoria Goodman is a registered dietitian and nutrition therapist and has been in private practice for over 20 years. Victoria has helped clients with a wide variety of health conditions and personal ambitions to improve health and make positive lifelong changes in behavior. Not only is Victoria accomplished in the science of medical nutrition therapy, she is passionate about promoting healthy dietary and lifestyle changes. A personalized approach in accordance to medical needs and food preferences is utilized to accomplish her missions. She earned her Bachelor's Degree in Nutrition Management from Syracuse University and her Master's Degree in Clinical Nutrition from Drexel University. Victoria is focused on developing relevant dietary and lifestyle strategies and implementing them to prevent or reduce menopausal symptoms.

ACKNOWLEDGEMENTS

I cannot begin to express my heartfelt thanks to Dr. Janet Ludwig for being the Chairperson of this project. I am indebted to her for her ongoing support, taking the time in taking to answer my endless telephone calls, questions, inquiries and making revisions.

I gratefully thank Dr. Dorothy Germano, Dr. Kirsten Laverdure and Dr. Samer Koutoubi, my superlative committee members, for whom this dissertation could not have happened. Each of you has provided me with extensive professionalism and personal guidance. You have taught me so much about scientific research. I appreciate you all.

TABLE OF CONTENTS

Chapter One- Introduction-----	9
Chapter Two- Problem Statement and Research Questions-----	12
Chapter Three- Literature Review-----	16
Steroid Hormones-----	16
Cortisol and Stress-----	19
Endocrine Disrupting Compounds (EDC's)-----	20
Health Risks in Menopause-----	21
Strategies for Mitigation of Health Risks-----	27
Summary-----	31
Chapter Four- Methodology-----	33
Study Population-----	34
Clinical Assessment-----	36
Materials for “ 10 Steps to Improve Menopausal Symptoms” Program----	36
Procedure-----	38
Chapter Five- Expected Results-----	41
Chapter Six-Discussion, Conclusions and Future Directions-----	44
Appendix A Menopausal Rating Scale-----	49
Appendix B Medical and Nutrition Survey-----	51
Appendix C Stages of Change Survey-----	53
Appendix D Food Log-----	55
Appendix E Food Frequency-----	56
Appendix F Calcium Rich Foods-----	57
Appendix G Protein Content Of Various Foods-----	58
Appendix H High Fiber Food List-----	59
Appendix I Mediterranean Food Pyramid-----	60
Appendix J Omega 3 Fatty Acid Food List-----	61
Appendix K Heart Health For Women-----	62
Appendix L Choose Heart Healthy Snacks-----	63
Appendix M Stress Relief Survey-----	65
Appendix N Stress Relief Strategies-----	66
Appendix O Thyroid Questionnaire-----	69
Appendix P Reduce Toxic Load-----	71
Appendix Q Healthy Snacking For Smoking Cessation-----	72
Appendix R 15 Ideas To Get Moving-----	73
Appendix S Start Your Exercise Program-----	74
Appendix T Letter to Primary Care Physician-----	75
Appendix U Flyer For Study-----	76
Appendix V Consent And Authorization Forms-----	77
References Cited-----	79
Addendum-----	86

LIST OF FIGURES AND TABLE

Figure 1 Sex hormone synthesis-----	16
Figure 2 Estrogen levels from puberty to postmenopause-----	18
Figure 3 Model of the endocrine systems targeted by EDC's-----	21
Table 1 10 Steps to Improve Menopausal Symptoms-----	38

ABSTRACT

DIET AND LIFESTYLE CHANGES TO MITIGATE MENOPAUSAL SYMPTOMS

Victoria Goodman

Hawthorn University 2019

Women's physical and mental health is critical to the healthy functioning of the family and society. Menopause is the cessation of menstruation and changes in hormone levels that women experience as a natural part of aging and sometimes it can cause adverse symptoms. These adverse effects may be mood swings, fatigue, hair loss, heart palpitations, hot flashes, night sweats, decreased sexual drive, weight gain, depression and anxiety. Most women are menopausal at the average age of 52 years. Additionally, because women are living longer (today the average life expectancy is 81 years as compared to 48 years in 1900) health concerns due to menopause have become important for a more productive life, at home, work and in relationship. The current study was undertaken to develop the "10 Step Plan to Improve Menopausal Symptoms" which is a diet and lifestyle program designed to target particular body symptoms negatively affected by hormonal change. The program is developed in three phases which are to : 1) evaluate and set goals to eliminate or reduce noxious agents from the body and environment, 2) remove existing compounds and conditions from the body which may be creating hormone imbalance and 3) rebalance the body through healthy diet and lifestyle practices. This is a twelve (12) week program, which will focus on thyroid and bone health, cardiovascular, brain and stress, and the integumentary system and vasomotor events. The implementation of this program is expected to result in an efficient and easy educational program with sustaining support systems for the reduction and elimination of common menopausal symptoms.

CHAPTER ONE-INTRODUCTION

Menopause is a natural process most women experience as a normal part of aging and occurs gradually over a number of years. It is simply the cessation of menstruation.

Perimenopause occurs before menopause at the average age of 45- 55 years of age (Gold, 2011).

There is controversy on this topic. It can be as short as one or two years and may last up to ten years. The average age a woman experiences menopause is 52 years of age. Menopause is when a woman's ovaries no longer secrete estrogen and only a small amount of progesterone and is defined as when a woman has not menstruated for one year due to the natural reduction of ovarian oocytes from maturing ("Menopause: Symptoms, treatment, Diagnosis," NA).

Menopause occurs in three evolutions. The first stage is when menstrual cycles vary at least seven or more days as compared to previous cycles. The second stage is when there is missed menstruation of at least sixty days. The third stage begins when there is missed menstruation for a twelve-month period. This signifies the end of perimenopause. Post menopause follows and can last up to six years (Goluch-Koniuszy, 2016).

Since life expectancy for women has increased, and thus menopause, health concerns women face due to menopause have become important in preventative care for a more productive life. Currently, life expectancy is at approximately 81 years as compared to the 1900's when it was forty ("Life expectancy at birth (in years) by gender," 2018; Northrup, 2012), thus women are living longer in a menopausal condition and will likely experience adverse menopausal symptoms.

Menopausal symptoms may result in less productivity of women at work, home and with relationship. Common complaints of women in menopause are mood swings, fatigue, hair loss, heart palpitations, hot flashes, night sweats, decreased sexual drive, weight gain and, depression and anxiety (Goluch-Koniuszy, 2016; Hyman, 2009). Menopausal symptoms are experienced by

70-85 percent of women, with 20 percent experiencing severe symptoms (Simpson & Morris, 2015). Current programs to relieve symptoms include Hormone Replacement Therapy (HRT), which are usually made of estrogen, progesterone and sometimes testosterone (Danby, 2005; Shekhar, Travis, He, Roman, & Fan, 2017). In 2002, The Women's Health Initiative Study determined higher risks of heart disease, stroke, blood clots, abnormal bleeding, cancer and depression (Bhavnani, 2002). Depending on a woman's risk factor, HRT may not be an appropriate therapy ("Hormone therapy: is it right for you?," 2015; Michaels & van Aalst, 2009).

Of further importance in the study of menopausal symptoms relief, there is evidence indicating that dietary intake and healthy lifestyle changes intended to mitigate menopausal symptoms may decrease a women's dependence on pharmaceuticals to relieve these symptoms. In a study by Rizzoli et al, prevention of osteoporosis in postmenopausal women was examined to determine if nutrition played a role. Menopause is a risk factor for developing osteoporosis (Rizzoli, Bischoff-Ferrari, Dawson-Hughes, & Weaver, 2014). This study concluded that healthy diet and lifestyle behaviors significantly reduced the risk of osteoporosis (Rizzoli et al., 2014). In a review of the literature, Jull et al determined that appropriate dietary intake and physical activity was related to a decrease in body weight during menopause.

Based on cutting edge research, diet and lifestyle changes to mitigate menopausal symptoms will provide a straightforward plan that makes the current research applicable for those women wishing to transform, improve and enjoy lifelong health.

Utilizing this research information, a clear approach using diet and lifestyle changes to reduce or eliminate menopausal symptoms has been developed. This will assist women to improve their quality of life as well as reducing the possible harmful effects and financial

obligation of pharmaceuticals. This research and resulting development of a holistic diet and lifestyle program when implemented in women with menopausal symptoms will improve their own health and that of their families, their work and society in general.

CHAPTER TWO-PROBLEM STATEMENT AND RESEARCH QUESTIONS

Research has indicated that diet and lifestyle changes may improve menopausal symptoms, and reduce the dependence of women on pharmaceuticals to relieve these symptoms (Bhavnani, 2002). Current programs to relieve symptoms may include Hormone Replacement Therapy (HRT), however they may carry significant health risks (Bhavnani, 2002; Danby, 2005). It is hypothesized that a diet and lifestyle program to alleviate menopausal symptoms thus reducing the dependence on pharmaceuticals could benefit women.

Problem Statement

Although menopause is a natural process most women experience as a part of natural aging, many women experience complaints of mood swings, fatigue, heart palpitations, hot flashes, night sweats, decreased sexual drive, weight gain, hair loss and depression and anxiety (Hyman, 2009; Perlmutter, 2004). Menopause occurs gradually over a number of years (Bener, Saleh, & Bhugra, 2016). Perimenopause occurs before menopause at the average age of 45-55 years of age. It can last up to ten years. The average age a woman experiences menopause is 52 years of age. Menopause is when a woman's ovaries no longer secrete estrogen and only a small amount of progesterone (Barrett, Barman, Boitano, & Brooks, 2012). Progesterone is needed to regulate estrogen and also acts as a precursor to testosterone and cortisol (Michaels & van Aalst, 2009). Follicle Stimulating Hormone (FSH) concentrations increase as well as Luteinizing Hormone (LH), due to this phenomenon (Barrett et al., 2012).

Menopausal symptoms are experienced by 70- 85 percent of women, with 20 percent experiencing severe symptoms (Simpson & Morris, 2015).

Menopause can influence many physiological changes, which may describe the relationship of chronic conditions and symptoms occurring in menopausal women (Choi et al., 2015). Hormonal imbalances during menopause can cause symptoms such as brain fog, mood swings, hot flashes

and night sweats, sleep difficulties, cognitive function, heart palpitations, fatigue, anxiety, depression, weight gain, hair loss, vaginal dryness and loss of sex drive. These disorders are due to changes in the sex hormones estrogen, progesterone and testosterone (Hyman, 2009; Schmidt, 2017; Sydora et al., 2017).

Conventional treatment for menopausal women may include HRT. However, depending on a woman's risk factor, HRT can increase the risk of heart disease, stroke, blood clots, abnormal bleeding, cancer and depression (Bhavnani, 2002; "Hormone therapy: is it right for you?," 2015; Michaels & van Aalst, 2009). Research has indicated that women taking estrogen alone have significantly more incidences of diabetes and cardiovascular disease. Postmenopausal women who took both estrogen and progestin experienced significantly more cases of breast cancer, cardiovascular disease and dementia. Studies also found that when women began HRT within 10 years of menopause, CHD increased even more significantly. Questions about timing, dose and duration of HRT remain (Force, 2002; "Hormone Replacement Therapy for the Primary prevention of Chronic Conditions in Postmenopausal Women: An Evidence Review for the U.S. Preventative Services Task Force," 2017). Given these concerns, many women seek alternative dietary and lifestyle changes to mitigate their symptoms.

Relevance of study

The many unfavorable physical and mental health changes that can occur during menopause may affect a woman's quality of life. This study will seek to evaluate the current literature and develop an innovative treatment approach using dietary and lifestyle changes to prevent or alleviate menopausal symptoms and thus, reduce a woman's dependence on pharmaceuticals. Ultimately, this will improve the woman's own health and that of her family, her work and society in general.

Gaps in prior research

Since 2002, when the Women's Health Initiative (WHI) was published and indicated that HRT may be harmful, there has been an increased interest in alternative treatment of menopausal symptoms such as diet and lifestyle behaviors (Bhavnani, 2002). The Women's Health Initiative is one of the largest long term national health studies investigating strategies for the prevention of cardiovascular disease, breast and colorectal cancers and osteoporosis in postmenopausal women. The WHI consists of a clinical trial, observational and community based studies ("Women's Health Initiative (WHI)," ND). There is evidence both supporting and contradicting dietary and lifestyle changes intended to mitigate menopausal symptoms (Jull et al., 2014; Nagata et al., 2012; Rizzoli et al., 2014). More research is needed to identify new approaches and provide new options for women.

Definition of terms

Cortisol- A steroid hormone made in the adrenal glands. It is controlled by the hypothalamus, pituitary and adrenal glands. It is also referred to as the 'stress hormone'.

Estrogen- A sex hormone that is responsible for the physical features of women and reproduction. It is produced by the adrenal glands and fat tissue.

Hair Loss- Shedding more than 100 hairs a day.

Heart palpitations- Awareness of cardiac muscle contractions: hard, fast and or irregular beats.

Hormone Replacement Therapy (HRT)- Usually made of estrogen, progesterone and sometimes testosterone.

Hot flashes and night sweats- Vasomotor symptoms due to temperature disruptions caused by the decrease in ovarian function and gonadal hormones.

Hypothyroidism- A condition when the thyroid gland does not produce enough of certain hormones upsetting the normal balance of the body.

Luteinizing Hormone- A hormone produced and secreted by the anterior pituitary gland and it controls ovary function.

Menopause- When a woman has not menstruated for one year and is due to the natural reduction of ovarian oocytes from maturing.

Osteoporosis- A gradual weakening of the bones where they become fragile and brittle and can increase one's risk of fracture.

Perimenopause- Occurring before menopause and can last up to ten years.

Pharmaceuticals- Compounds created for medicinal purposes.

Progesterone- A female sex steroid hormone.

Steroid hormones- Synthesized from cholesterol and generated in the adrenal and reproductive glands, and includes progesterone, cortisol, the androgens, testosterone and estrones.

Research Questions

1. How do steroidal hormones function normally in the woman's body during the menstrual cycle and in menopause?
2. Will a dietary and lifestyle program alleviate menopausal symptoms thus reduce the dependence of women on pharmaceuticals?
3. What adverse effects, if any, are identified with dietary and lifestyle changes?

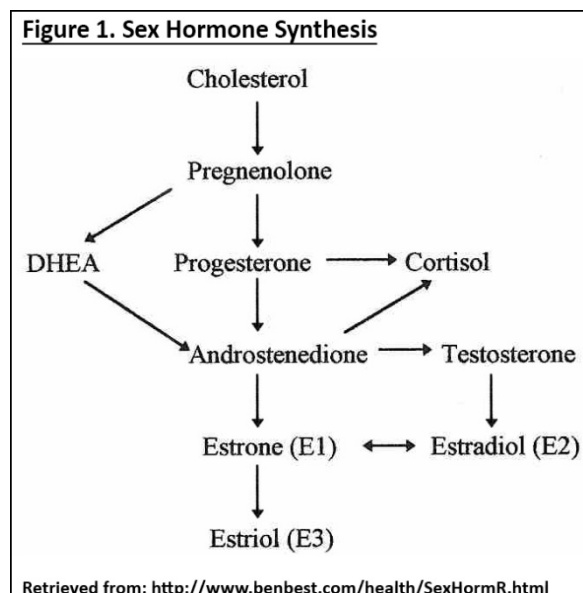
CHAPTER THREE-LITERATURE REVIEW

There is evidence both supporting and contradicting dietary and lifestyle changes intended to mitigate menopausal symptoms. A literature review was conducted to examine the current research related to the issue as to whether or not diet and lifestyle behavioral change may alleviate menopausal symptoms thus reducing the dependence on pharmaceuticals. Based upon these evidence-based studies a program has been developed to mitigate the adverse effects experienced by many women during menopause. This protocol involves diet and lifestyle changes targeting three areas to 1) reduce exposure to noxious compounds contributing to hormone imbalance, 2) remove noxious compounds from the body and 3) rebalance the body through healthy nutrition and lifestyle practices.

Steroid Hormones

The endocrine system is a group of glands that secrete chemical messages, termed hormones that control the body's metabolism. These glands, such as the pineal, hypothalamus, pituitary, thyroid, parathyroid, thymus, pancreas, adrenal, and gonads, secrete hormones directly into the bloodstream. There are three major types of hormones. These are 1) protein hormones, 2) amine hormones derived from amino acids and 3) steroid hormones derived from lipids ("The endocrine system," 2018). This discussion will focus on the steroid hormones as depicted in

Steroid hormones are generated in adrenal glands and reproductive glands as shown in Figure 1 and include: progesterone, cortisol, the androgens, testosterone, estrogens and derivative.



the

Steroid hormones are synthesized from cholesterol, which is produced in the liver or from the diet, thus, hormonal production is connected to liver health.

Both males and females produce estrogen, progesterone and testosterone, but in different ratios. Men primarily produce testosterone with small amounts of progesterone and estrogen. Women primarily produce estrogen and progesterone with small amounts of testosterone. When these ratios become altered unnaturally, health complications will occur, some of which will be discussed below. These hormones are chemical messengers meant to activate another gland or organ or metabolic process and set it into motion. Specialized cells secrete hormones that attach to another cells receptor site (within a gland or organ) and send a message to do something, such as excrete a substance, or to either increase or decrease activity level. For this highly complex system to work, the body needs to be able to recognize, receive, use, and then metabolize and excrete that hormone. Failure at any stage of this process will result in complications and hormone imbalances leading to less than ideal health.

Since menopause is a result of changes in the production of steroid hormones metabolic changes will occur such as decreased energy, weight gain, depression and irritability.

When estrogen and progesterone are not properly balanced, thyroid producing hormones are prevented from being effective, even if hormone levels are appropriate, making them ineffectual (Northrup, 2012). In fact, there are 3 different types of estrogen, and their concentration imbalances can cause the many physiological conditions. The 3 different types are estradiol, estrone and estriol (see Figure 1).

Before menopause, estrogen levels are at the highest level, other than pregnancy (see Figure 2), and is produced by the ovaries. This form of estrogen circulates throughout the body,

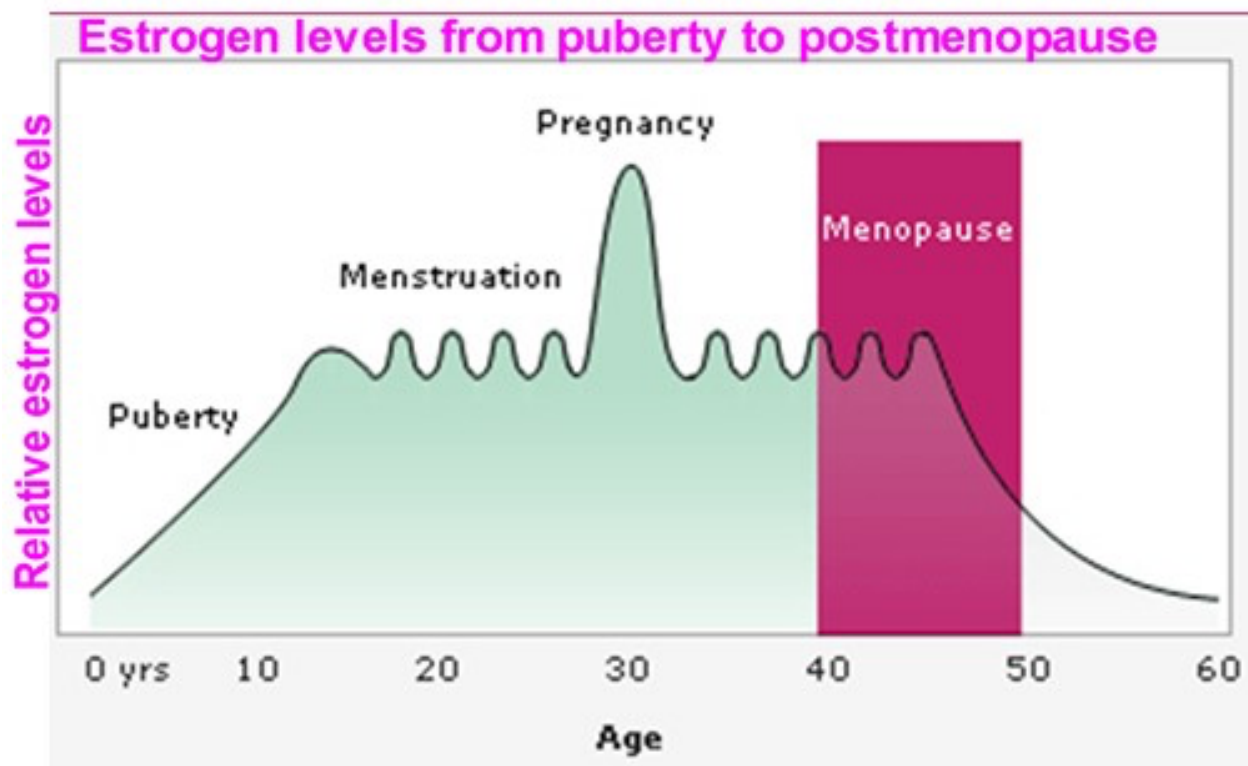


Figure 2: Estrogen levels from puberty to postmenopause. Retrieved from: <https://www.womens-health-advice.com/menopause-effects.html> ("The hormones that cause menopause," n.d.)

and provides protection of the heart, brain and skin. Estradiol encourages the body to remain lean, lower blood pressure, and improve lipid profile. It also helps to elevate mood, energy and control hunger. Estrone is produced in the body's fat cells and adrenal glands. Estrone can transform into estradiol until menopause, when this change is not possible. Estriol is a weak hormone produced by the placenta and is not nearly as effective as the other two. Estriol may benefit bone and cardiovascular health. In menopause, estradiol decreases, and estrone increases, which encourages fat to move from the hips and behind, to the abdominal area. This creates a vicious cycle because the increased fat at the belly area causes estrone levels to increase even further. Increased estrone also supports insulin resistance (Michaels & van Aalst, 2009). Fat accumulation in the abdominal area increases the risk of developing cardiovascular disease, type 2 diabetes, osteoarthritis, cancer and gall bladder disease (Goluch-Koniuszy, 2016).

Cortisol and Stress

Produced in the adrenal glands, cortisol is a steroid hormone and is associated to the stress response ("What is Cortisol," 2018). Cortisol is produced from cholesterol ("Cortisol-its role in stress, inflammation and indications for diet therapy," 2009). Secretion of cortisol is controlled by the hypothalamus, the pituitary gland and the adrenal glands known as the HPA axis. Because most cells have cortisol receptors, cortisol influences many bodily functions such as blood sugar ("What is Cortisol," 2018) . Increased cortisol levels provide the body with glucose because it uses protein stores in the liver for energy. This is good on a short term basis if needing to escape a stressor, but if long term, it causes increased blood sugar ("What is Cortisol," 2018). Increased blood sugar may lead to weight gain as increased blood sugar influences appropriate insulin production, creating cells in need of glucose. The body's response is to send hunger indications to the brain causing one to overeat. The unused glucose is stored as fat tissue ("What is Cortisol," 2018).

Cortisol also helps to control blood pressure because it helps with salt and water balance ("What is Cortisol," 2018). Stress may influence the age of which menopause can occur. Women with high levels of stress have a lower mean average of age of menopause as compared to women with lesser stress levels. This is important because menopause can increase risk of several health conditions. Increased stress levels also have their own physiological effects. Stress influences hormones that act upon the central nervous system and can encourage several diseases such as diabetes, hypertension, poor lipid control, chronic fatigue syndrome, gastrointestinal conditions and depression. Stress also as an effect on the hypothalamic pituitary axis, glucocorticoid and catecholamine production, which also supports disease development (Choi et al., 2015). Metabolism, inflammation and memory may also be influenced by cortisol ("What is Cortisol," 2018).

Stress can also disrupt cortisol and progesterone levels. Cortisol and progesterone compete for the same receptor sites on cell membranes. If there are increased levels of cortisol, progesterone levels will decrease in the body (Michaels & van Aalst, 2009). When a woman experiences increased stress, the hormone epinephrine signals the body to stop making insulin. Once the stressful event is over, cortisol communicates whether carbohydrate, fat or protein is going to be used for energy. Increased cortisol may cause one to crave high fat and simple carbohydrate foods. It also increases risk of osteoporosis as it works to weaken bone and make it more challenging to decrease weight (Michaels & van Aalst, 2009).

Endocrine Disrupting Compounds (EDC's)

Endocrine disrupting compounds (EDC'S) are defined as “ an exogenous agent that interferes with synthesis, secretion, transport, metabolism, binding action, or elimination of natural blood borne hormones that are present in the body and are responsible for homeostasis, reproduction, and developmental process” (Diamanti-Kandarakis et al., 2009). EDC's are found in chemicals, their by-products, plastics, pesticides, medications and food. EDC's can negatively impact thyroid function as they influence thyroid hormone regulation and production, as well as iodide uptake by the thyroid gland. Iodide is the form of iodine the thyroid requires for its proper functioning. Exposure to EDC's has been linked to approximately 2-4 years early menopause as compared to women who were unexposed (Extance, 2015). EDC's are structurally similar to hormones and can influence the metabolism at the cellular level by interfering with synthesis, transport, action and degradation of hormones, even at low exposure levels (Schug, Janesick, Blumberg, & Heindel, 2011). Additionally, besides the thyroid system being affected by EDC's, other endocrine systems may also be compromised by their presence as illustrated in Figure 3 below.

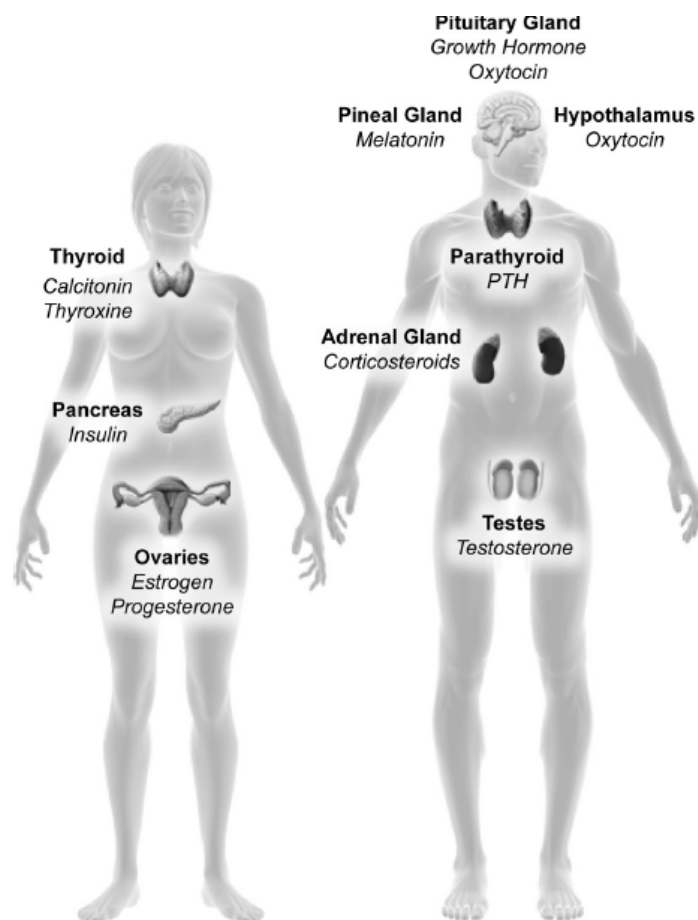


Fig. 1. Model of the endocrine systems targeted by EDCs. This figure illustrates that all major endocrine organs are vulnerable to endocrine disruption, including the HPA axis, reproductive organs, the pancreas, and the thyroid gland. EDCs are also known to impact hormone-dependent metabolic systems and brain function.

Figure 3: Model of the endocrine systems targeted by EDC's.

Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/21899826>

Health Risks in Menopause

Hypothyroidism

The change in steroid hormone balance during menopause influences the body's metabolism, which can result in decreased energy, weight gain, depression and irritability.

Thyroid problems are not unusual. Twenty six percent of menopausal women are diagnosed with hypothyroidism. Symptoms of hypothyroidism include unintentional weight gain, hair loss, fatigue, constipation, decreased sexual drive and intolerance to cold temperature.

Subclinical hypothyroidism has the similar physiological symptoms as menopause. Diagnosis is made when Thyroid Stimulating Hormone (TSH) are at least 3 pg/ml, but less than 10pg/ml. Causes of subclinical hypothyroidism can include environmental toxins that enter the body and cause disruptions in hormone functioning. Stress is also another influencing factor because it slows the metabolism as it puts the body into a state of preventing famine. The decrease in metabolism causes the body to increase reverse T3 levels, which in turn binds to T3 receptors. This response further decreases metabolism, which can lead to weight gain (Gersh, 2017).

Bone Health

With the decrease in estrogen, progesterone and testosterone, there is also a decrease in bone density and muscle mass (Maltais, Desroches, & Dionne, 2009). Bone loss occurs in 1 out of 3 postmenopausal women. Normal bone loss during the first few years of menopause is 2 to 3 percent. Every year after there is a 0.5 to 1 percent loss (Rizzoli et al., 2014). Fifty five percent of the population who are at least 50 years of age has either osteopenia or osteoporosis. Osteopenia is considered the early stage of osteoporosis. When one develops osteoporosis, the bones become brittle, porous and can fracture easily (Northrup, 2012). Osteoporosis can lead to a decrease in physical restrictions, pain and deformity (Maltais et al., 2009; Northrup, 2012). Common fractures include hip, forearm and spine (Rizzoli et al., 2014). Osteoarthritis and sarcopenia are also of concern.(Kalra, Agarwal, & Magon, 2012). Women accumulate fat in their muscle because they use more glycogen for energy. This occurs because the decreased estrogen levels in menopause may influence Lipoprotein Lipase (LPL), an enzyme crucial for using triglycerides found in muscle. In pre- menopausal women, LPL decreases fat storage as compared to menopausal women (Maltais et al., 2009).

Protein, calcium, vitamin D, potassium and phosphorus are required for good bone health. It is also important to engage in strength training exercises, reduce alcohol intake and avoid smoking. Bone mass is composed of 50 percent protein. Protein is necessary for bone structure, a hormone called IGF-1, which is needed for bone growth, and increases calcium absorption from the kidneys (Rizzoli et al., 2014). Calcium is fundamental for bone rigidity. Vitamin D is necessary for calcium regulation. When deficient, the amount of calcium absorption from the intestinal tract is decreased. When vitamin D levels are lower than 50nmol/L, risk of developing osteoporosis is increased (Rizzoli et al., 2014).

Cardiovascular Disease

Heart disease is the most common cause of death in women 65 and older (Northrup, 2012). Ischemic stroke is the worldwide cause of morbidity and mortality (Shekhar et al., 2017). As compare to men, menopausal women have an increased risk of having a stroke. It is not menopause that causes heart disease but rather the issues surrounding what may occur during menopause, along with a poor diet, physical inactivity and smoking ("Heart disease facts and statistics," ; "Menopause and heart disease," 2017). Also, changes in estrogen and progesterone levels influence estrogen receptor signaling pathways, which may increase the risk of stroke (Shekhar et al., 2017). Estrogen protects the inner layers of arterial walls, which allow blood vessels to accommodate blood flow. Menopause is also associated with increased blood pressure, which may be caused by increases and changes to body fat distribution, in addition to age and obesity. Low Density Lipoproteins (LDL) and triglyceride levels tend to increase during menopause (Agrinier et al., 2010). Hyperinsulinemia may occur due to the accumulation of fatty tissue in the visceral area. This influences the stimulation of the sympathetic nervous system, increased sodium absorption and stimulation of the renin angiotensin aldosterone system. This can cause blood pressure to increase (Park et al., 2015).

Brain Function Changes

The World Health Organization has stated the most common health problems women face is depression, affecting 9- 12 percent of women worldwide (Bennett et al., 2010). Symptoms of depression may include depressed mood, feelings of worthlessness, loss of appetite, decreased cognitive function, sleep disturbances and fatigue (Barrett et al., 2012). Depression can be debilitating as it may negatively influence relationships, work productivity and increase risk of self-harm or suicide (Soares, 2016, 2017; Zang, He, Chen, Ge, & Yao, 2016). Depression not only affects quality of life but has an economic effect on healthcare (Dibonaventura, Wagner, Alvir, & Whiteley, 2012). Neurotransmitters, which are decreased in those diagnosed with depression serve as messengers to the central nervous system. Catecholamines, dopamine, serotonin, gamma-aminobutyric acid (GABA), acetylcholine and glutamate are the main transmitters involved for brain function (Bennett et al., 2010). Decreased estrogen and progesterone, increased FSH and changes in estradiol may be the reason why mood changes occur ("Depression at menopause," 2007; Schmidt, 2017). Estrogen enhances the production of neurotransmitters such as serotonin. The brain has receptors for all of the hormones (Hyman, 2009). Not only does decreased testosterone levels negatively influence mood, memory and brain function, but when a woman is overweight, consumes a diet high in simple carbohydrates, is not physically active and has increased levels of stress, testosterone levels may further decrease (Hyman, 2009).

Fifty to 60 percent of the adult brain is composed of lipids (Schachter et al., 2005). Since the body is not efficient in producing fat, it must come from dietary intake (Gomez-Pinilla 2008). One of the best fats for the brain are omega 3 fatty acids (Hyman, 2009). This particular fat is broken down into eicosapentanoic acid (EPA), and docosahexanoic acid (DHA) (Perlmutter, 2004). Omega 3 fatty acids influence cell membrane fluidity as it moves cholesterol from the cell

membrane. Cholesterol may make the cell membrane rigid. Cell flexibility allows for neurotransmitter attaching and messaging within the cell, permitting critical messages to get in and out of cell (Hyman, 2009; Logan, 2004). Research has indicated that dietary saturated fats and trans fats have a negative effect on brain health (Gomez-Pinilla 2008; Hyman, 2009; Perlmutter, 2004).

Decreased levels of folic acid, B6 and B12 have been found in individuals diagnosed with depression (Hyman, 2009; Perlmutter, 2004). These nutrients are also fundamental to the body's methylation process (Hyman, 2009). Methylation is a process that transfers one carbon and three hydrogen atoms to every molecule in the body, and is vital for production of neurotransmitters, bone density and DNA repair (Perlmutter, 2004).

Stress

Studies have indicated that stress can influence the age of menopause. Women who experience high levels of stress have a lower mean average of menopause as compared to women with lower stress levels. This is an important finding because menopause can increase the risk of several health conditions. Increased stress levels also have their own physiological effects. Stress influences hormones that act on the central nervous system and can impact several diseases such as diabetes, hypertension, poor lipid control, chronic fatigue syndrome, gastrointestinal conditions and depression. Stress also has an effect on the hypothalamic pituitary axis. Stress influences glucocorticoids and catecholamine, which support disease development (Choi et al., 2015). Stress may also disrupt cortisol and progesterone levels. Cortisol and progesterone compete for the same receptor sites on cell membranes. If there is increased levels of cortisol, progesterone levels will decrease (Michaels & van Aalst, 2009).

When experiencing increased stress, the hormone epinephrine signals the body to stop making insulin. Once the stress event is over, cortisol communicates whether carbohydrate, fat or

protein is going to be used for energy. Increased cortisol may cause high fat and simple carbohydrate food cravings. It also increases osteoporosis risk as it works to weaken the bone and makes it more challenging to decrease weight. (Michaels & van Aalst, 2009).

Integumentary System Changes

Hair loss and skin changes are also common complaints for menopausal women. Twenty to 60 percent of women experience hair loss and dry skin and this is most likely due to a decrease in estrogen. More than 100 lost hair strands a day may indicate a problem. Proteins that contain sulfur amino acids, cysteine and methionine are important because they are precursors to keratin, which is required for hair growth. L- Lysine is also important as this composes the root of the hair and lends to hair volume. The outside of the hair strand is made of linoleic, linolenic and long chain polyunsaturated fatty acids. Inappropriate intake of these fats may contribute to hair loss. Fats from cholesterol make a protective coat on the hair strand and help with the hairs hydration. Appropriate dietary sources are fatty fish, plant oils, nuts and seeds. Simple carbohydrates encourage hair loss because they support sebum secretion by the sebaceous glands. This allows for fatty acids to be released, causing inflammation. Simple carbohydrates may also effect blood sugar, which causes ovarian androgens to increase ensuing hair loss (Goluch-Koniuszy, 2016).

Vasomotor Symptoms

A vasomotor symptom such as hot flashes and night sweats occur because of the decrease in ovarian function. Seventy five to eighty percent of menopausal women experience these physiological changes (Barrett et al., 2012; Deecher & Dorries, 2007). In fact, it is these symptoms women most likely seek treatment for (Deecker & Dorries, 2007). Women who experience hot flashes are at greatest risk of depression ("Depression at menopause," 2007). Hot flashes and night sweats occur due to temperature disruption caused by gonadal hormones.

Disorder of the extremely controlled body temperature results in amplified heat loss reactions (Deecher & Dorries, 2007). Luteinizing Hormone (LH) is secreted in the body at 30 to 60 plus minimum intervals. Each secretion begins at the onset of a hot flash. However, LH is not the only cause. Hot flashes are also due to an estrogen sensitive event occurring in the hypothalamus, which in turn enhances LH secretion (Barrett et al., 2012). Hot flashes can last one to fifteen minutes. Women may experience a warming feeling, resulting in upper body and face flushing due to unexpected heat and perspiration during the night, which may cause sleep disturbances (Deecher & Dorries, 2007). This is important to consider because adequate sleep is needed to repair hormones and DNA. Appropriate sleep is also required for maintaining proper levels of cortisol. This particular hormone influences weight gain, brain function, bone loss, the immune system and risk of diabetes and hypertension (Hyman, 2009).

Strategies for Mitigation of Health Risks in Menopause

Hormone Replacement

Current programs to relieve symptoms include Hormone Replacement Therapy (HRT), which are usually made of estrogen, progesterone and sometimes testosterone (Danby, 2005; Shekhar et al., 2017). HRT is sometimes recommended to decrease risk of heart disease, and reduce vasomotor symptoms and depression. However, in 2012, The Women's Health Initiative Study determined higher that there was a higher risk of heart disease, stroke, blood clots, abnormal bleeding, cancer and depression in women on HRT (Bhavnani, 2002; "Women's Health Initiative (WHI)," ND). Thus, depending on a women's risk factors for the above, HRT may not be an appropriate therapy ("Hormone therapy: is it right for you?," 2015; Michaels & van Aalst, 2009).

Nutrition and Lifestyle

Frequent meals and snacks throughout the day are valuable in helping the body tune into its natural hormonal rhythms and calorie burning measures (Michaels & van Aalst, 2009). Frequent meals and snacks help to maintain normal blood sugar and insulin levels, which can attribute to weight gain (Northrup, 2012). Reduce simple carbohydrates and alcohol, and consume whole grains. The whole grains tend to make one feel satisfied. It is also recommended that protein be consumed with each meal or snack (Hagey & Warren, 2008; Jull et al., 2014; Kahleova, Lloren, Mashchak, Hill, & Fraser, 2017). Fruits and vegetables are associated with phytochemicals, including antioxidants and phytoestrogens. It is interesting that during menopause, estrogen can no longer provide adequate protection against oxidative stress, which is fundamental for heart health and reduced risk of metabolic syndrome (Hong & Kim, 2017).

Consuming a well balanced diet consisting of lean proteins, omega 3 fatty acids, rich colored fruits and vegetables and dairy are suggested for bone health (Maltais et al., 2009; Northrup, 2012). A balance of calcium and vitamin D is recommended to prevent either from leaching from the bone (Rizzoli et al., 2014). Suggestions include milk and milk products such as cheese and yogurt and fortified breads and cereals, which contain both nutrients. Fatty fishes, and fish that contain small bones such as anchovies and sardines are also wonderful ways to get the calcium and vitamin D needed for healthy bones. Rich and colorful fruits and vegetables also contain nutrients appropriate for bone health. They include kale, spinach, broccoli, red pepper, sweet potatoes, strawberries, blueberries, oranges and pineapple. Caffeine and alcohol consumption may increase bone loss as they contribute to decreased calcium absorption ("Food and your bones- osteoporosis nutrition guidelines," 2017). The recommended dietary calcium intake is 1200 mg daily, and optimally should come from dietary sources. Vitamin D intake should be approximately 200 IU daily. Since it is more difficult to obtain from food,

supplementation is recommended ("Food and your bones- osteoporosis nutrition guidelines," 2017; Northrup, 2012).

The American Heart Association recommends that as part of a healthy diet, saturated fat should be limited to no more than 7 percent of total caloric intake. Saturated fats are found in meat, processed meat, chicken and fish, dairy and hydrogenated fats such as butter. Strategies to limit saturated fat include choosing lean meats, fat free or low fat dairy and hydrogenated fats. The reason why a diet limited in in saturated fats may be important because saturated fats, along with trans fats and cholesterol, cause high-density lipoproteins to increase. Limiting saturated fats is usually a manageable strategy to prevent or decrease risk of atherosclerosis ("American heart association,"). Consume fatty fish such as salmon, tuna, mackerel and sardines at least two times per week and add ground flax seeds and nuts to favorite dishes ("American Heart Association," ; "Mediterranean diet,").

Consuming a diet rich in fruits and vegetables, which increases antioxidants and fiber is beneficial to heart health. Fatty fish such as tuna, salmon, mackerel, and fats such as extra virgin cold pressed olive oil, nuts, seeds and avocados, also contribute to increasing the antioxidant omega 3 fatty acids are essential for heart health ("American Heart Association," ; Bulliyya, 2001; "Mediterranean diet for heart health," 1998-2016; "Menopause and heart disease," 2017). For a healthy brain and to prevent or decrease symptoms of depression, consume a diet rich in omega 3 fatty acids. These can be found in foods such as fatty fish, extra virgin cold pressed olive oil, nuts, seeds and avocado (Hyman, 2009; "Mediterranean diet for heart health," 1998-2016; "Menopause and heart disease," 2017; Perlmutter, 2004). Consuming saturated and trans fats have a negative effect on brain health (Gomez-Pinilla 2008). Foods rich in folate, tryptophan and flavonols positively influence brain health (Gomez-Pinilla 2008; Low Dog, 2005). Foods rich in

folate include dried beans and legumes, asparagus and broccoli ("World's healthiest foods rich in folate," 2001-2017). Tryptophan containing foods include nuts, seeds, tofu, fish, poultry and eggs (Young, 2007). Flavonals are found in foods such as apples, red grapes, pomegranates, black berries and cocoa (Gomez-Pinilla 2008). As neurotransmitters are built from amino acids, it is recommended that adequate protein intake from lean sources such as fish, poultry, lean red meat and eggs be consumed (Hyman, 2009).

Physical activity, both aerobic and strength training is fundamental to improve bone, muscle mass and strength. Physical activity may also reduce vasomotor symptoms and improve sleep. Regular physical activity at 30 minute intervals 2- 3 days per week improve vasomotor symptoms, improved blood pressure and lipid profile, blood glucose control, weight and mood (Fogleman, 2012; Hagey & Warren, 2008; Mishra, Mishra, & Devanshi, 2011). Other lifestyle strategies include reduced alcohol consumption, smoking cessation and adequate sleep (Rizzoli et al., 2014).

Health Behavior Change

Health behavior theories provide the framework on which health behavior change is made. Theories explain and predict how and when change is completed. Often several theories are combined to encourage behavior change (Fertman & Allensworth, 2017). Diet and Lifestyle Changes to Mitigate Menopausal Symptoms will use The Transtheoretical Model, also called the Stages of Change Model (Fertman & Allensworth, 2017; "Health belief model," nd; "The transtheoretical model," 2017).

The Transtheoretical Model was developed in the early 1980's and was also developed to understand behavior change. This theory hypothesizes that change occurs in a specific sequence of stages. The stages are precontemplation, contemplation, preparation, action and maintenance.

It takes into account both the pros and cons of behavior change. Throughout all stages, the individual can evaluate the benefits and negatives of change. When an individual perceives more positives than negatives, the change ensues (Fertman & Allensworth, 2017). Strengths to the Transtheoretical Model include the raising of consciousness toward behavior change, and help one to understand the personal impact of changing behavior as well as helping one to commit to behavior change. This theory is appropriate for making intentional changes and considers emotions and conditions. This theory recognizes that the different stages of change are associated with high retention rates, and also that small steps in changes can measure progress of behavior change. Weaknesses to this theory are that stages are based on changes within a 6 month period. Also, people tend to move back and forth between stages and may be tempted to indulge in unhealthy behavior if exposed to a stressful event. This theory relies on self- support and does not take into account if one is ready for change (Fertman & Allensworth, 2017; "The transtheoretical model," 2017; Weinstein, Sandman, & Blalock, 2008).

Summary

The information gained from previous studies discussed in this chapter indicates that hormonal imbalances during menopause can cause symptoms that impair a woman's lifestyle. Based upon the nutrition and lifestyle factors described above a program to improve menopausal symptoms titled, "10 Steps to Improve Menopausal Symptoms" targeting specific body systems that are adversely affected by hormonal changes has been developed. The program will consist of three phases: 1) Evaluate and set goals to reduce noxious agents from the body and environment, 2) Remove existing elements from the body that are creating imbalance, and 3) Rebalance and heal the body through nourishing food, exercise, and healthy lifestyle practices. These three phases will be conducted in a twelve-week program either individually or in cohort groups of from six to twelve women. The

individual and/or cohort groups with the researcher will meet weekly in order to learn and follow the program as well as to develop camaraderie to give support and ensure a good outcome for each participant.

CHAPTER FOUR-METHODOLOGY

As described in the Literature Review, research has indicated that diet and lifestyle changes may improve menopausal symptoms, and reduce the dependence of women on pharmaceuticals to relieve these symptoms. Current programs to relieve symptoms may include Hormone Replacement Therapy (HRT), however they may carry significant health risks (Bhavnani, 2002; Danby, 2005). It is hypothesized that a diet and lifestyle program to alleviate menopausal symptoms thus reducing the dependence on pharmaceuticals could benefit women.

Menopausal symptoms are experienced by 70- 85 percent of women, with 20 percent experiencing severe symptoms (Simpson & Morris, 2015). Menopause can influence many physiological changes, which may describe the relationship of chronic conditions and symptoms occurring in menopausal women (Choi et al., 2015). Hormonal imbalances during menopause can cause symptoms such as brain fog, mood swings, hot flashes and night sweats, sleep difficulties, cognitive function, heart palpitations, fatigue, anxiety, depression, weight gain, hair loss, vaginal dryness and loss of sex drive. These disorders are due to changes in the sex hormones estrogen, progesterone and testosterone (Hyman, 2009; Schmidt, 2017; Sydora et al., 2017).

This project has been chosen because traditional nutrition and lifestyle counseling, has, in general, not been considered a part of the treatment standard of care for women with menopausal symptoms. The many unfavorable physical and mental health changes that can occur during menopause may affect a woman's quality of life. This study will seek to develop an innovative holistic treatment approach using dietary and lifestyle changes to prevent or alleviate menopausal symptoms targeting body systems that are particularly affected by hormonal changes. The

current program titled, “10 Steps to Improve Menopausal Symptoms” has been developed. Each participant will complete a comprehensive health questionnaire that includes her menopause symptoms and other health related issues. Risk factors include a family history of heart disease, elevated blood pressure, obesity, smoking, pre-diabetes, high blood cholesterol and high blood pressure. Based upon the results, a personalized dietary and lifestyle program will be developed. This approach enables the researcher to develop a treatment plan through education and support that is unique to each woman.

Study population

Perimenopausal and menopausal women will be targeted for this study. Perimenopause begins with menstrual irregularity and ends one year later with amenorrhea (Santoro, 2016). Menopause is when a woman has not menstruated for one year and is because of the natural reduction of ovarian oocytes ("The hormones that cause menopause," ND; "Menopause: Symptoms, treatment, Diagnosis," NA). Women who experience or would like to reduce or prevent vasomotor symptoms, weight gain, mood swings, fatigue, heart palpitations, decreased sexual drive, osteoporosis, depression and anxiety may consider following the proposed 12 week dietary and lifestyle program (Danby, 2005; Hyman, 2009; Northrup, 2012; Rizzoli, Bischoff-Ferrari, Dawson-Hughes, & Weaver, 2014). The targeted population will originate from 3 clinics from which the researcher is affiliated, and are in the vicinity of the researcher's private practice as a registered dietitian.

The client population will be local residents to the Dresher, Pennsylvania area, who are seeking to reduce and or eliminate menopausal symptoms. Current programs to relieve symptoms include Hormone Replacement Therapy (HRT), which are usually made of estrogen, progesterone and sometimes testosterone (Danby, 2005; Shekhar, Travis, He, Roman, & Fan, 2017). HRT is sometimes recommended to decrease risk of heart disease, and reduce vasomotor

symptoms and depression. However, in 2002, The Women's Health Initiative Study determined higher risks of heart disease, stroke, blood clots, abnormal bleeding, cancer and depression (Bhavnani, 2002). Depending on a woman's risk factor, HRT may not be an appropriate therapy ("Hormone therapy: is it right for you?," 2015; Michaels & van Aalst, 2009). The target population is primarily Caucasian, apparently healthy women between the ages of 52 to 62 years who exhibit symptoms of weight gain, mood swings, depression and anxiety, heart palpitations, vasomotor, fatigue, hair loss, thyroid issues and decreased sexual drive.

Recruitment policy letters will be sent to three clinics from which participants will be recruited. Flyers pertaining to the study alerting those in waiting and exam rooms will also be distributed (See Appendices T, U). During the initial consultation appointment with the prospective participant in the researcher's office, the researcher will evaluate menopausal symptoms. Those who meet initial criteria and express continued interest in participating will sign the Consent Form (See Appendix V). Informed consent will be obtained from all study participants before the study begins. The Consent Form will be provided and explained, and the researcher will answer any questions. The Consent Form includes an authorization in order for the researcher to communicate with the participant's usual care team regarding laboratory, blood pressure, DEXA results, and any other pertinent information regarding health. In the event that a participant does not meet eligibility criteria because of age limitations, cardiovascular disease, cancer, uncontrolled diabetes, Alzheimer's disease or other concerns, the participant will not be included in the study.

After completing the in-person consent and screening visit, eligible participants, will schedule their next 6 visits over a 3 month period. Height and weight measurements will be assessed in the researcher's office using a digital scale and a height rod. The researcher will ask the participant to remove shoes and any bulky clothing such as a jacket. The researcher will zero

the scale before the participant steps onto the scale. The participant will be asked to look straight ahead and stay still on the scale. The researcher will wait for the digital screen to settle before recording measurement. To assess height, the participant will be asked to turn around on scale and to stand with their back to the wall, looking forward. The participant should be positioned directly underneath the measuring rod. The rod will be lowered until the device sits gently on top of the head and recorded. Body height will be measured to nearest 0.1 cm. Body Mass Index (BMI) will be calculated.

Clinical Assessment

The researcher will be conducting an assessment on diet and lifestyle and menopausal symptoms. Survey and resources will be distributed and explained at the beginning of the program. Parameters to assess the symptoms of menopause will include weight gain, hot flashes and or night sweats, heart palpitations, sleep disturbances, mood swings, depression and anxiety, cognitive impairment, hair loss, thyroid issues and decreased sexual drive. These parameters will be assessed using the Menopausal Rating Scale, which is a tool that has been widely used in many research studies. The survey will be self-reported (See Appendix A). This scale was developed to determine symptoms and complaints of menopausal women. It measures symptoms over time and research has demonstrated it has a high reliability and validity (Schneider, Heinemann, Rosemeier, Potthoff, & Behre, 2000).

Materials for “10 Steps to Improve Menopausal Symptoms” program

Forms and questionnaires will be used to evaluate the participant’s initial health status prior to the start of the program. Additionally, her diet, exercise program, stress reduction techniques, and stages of change for a healthier lifestyle will be assessed. The study participant will complete these forms and questionnaires with the researcher in the office. These will be

administered at the onset of the program, during and then again at the twelve week reevaluation and conclusion of the study.

The Medical and Nutrition Survey (Appendix B) is a measurement of the general medical status, nutrition and health symptoms for each participant. The demographic information would not change in a 12 week period, however, the participant's weight and lifestyle habits such as grocery shopping habits and smoking status might have changed during the 12 weeks as a result of the participant's efforts to implement a healthier lifestyle.

The Stages of Change survey (Appendix C) will gauge what stage the participant is in at the beginning of the program based upon the transtheoretical model of behavior change ("The transtheoretical model," 2017). At the initial appointment the researcher will collect forms on diet through a food log and food frequency survey (Appendices D, E) and a nutrition analysis report will be generated in order to evaluate and advise the participant on their eating habits. These surveys are a measure of what each participant will be doing to improve their diet and lifestyle at the beginning of the study and will be used by the researcher to make appropriate recommendations to improve the participant's diet throughout the program. The participants will be given information on how to add and or modify foods to their diet that are anti-inflammatory, and anti-oxidant (Appendices F-L). They will also receive a brochure on how to reduce stress (Appendix N).

The Stages of Change survey is also intended to elucidate the issues a participant might have in making the decision to improve diet and lifestyle. The participant may face a number of concerns in relation to obtaining the foods, cooking the foods, or storing the foods that are recommended. This survey will also be used to measure the personal motivation of the participant to change their diet and improve their lifestyle choices. If the participant is not motivated to change, or has not been educated in the benefits of making a change, then the

potential that they will improve their diet during the 12 week healing period will be low. Each participant will be given information to educate them on the benefits of changing their diet and lifestyle. The Stages of Change survey will be re-administered during the program to see if they have progressed through the stages of change.

Procedure

The “10 Steps to Improve Menopausal Symptoms” program targeting specific body systems that are adversely affected by hormonal changes has been developed. The program will consist of three phases: 1) Evaluate and set goals to reduce noxious agents from the body and environment, 2) Remove existing elements from the body that are creating imbalance, and 3) Rebalance and heal the body through nourishing food, exercise, and healthy lifestyle practices. These three phases will be conducted in a 12 week program either individually or in cohort groups of from six to twelve women. It is anticipated that 24 women will enroll in the study. The individual and/or cohort groups will meet with the researcher as indicated in Table 1 (below) in order to learn and follow the program, as well as to develop camaraderie to give support and ensure a good outcome for each participant. See Addendum for specifics.

Table 1. 10 Steps to Improve Menopausal Symptoms

Week	Phase	Targets	Appendix-Materials	Outcomes	Physiological Assessment
1 Introduction, Assess and advise	One: Evaluate and set goals	Assess and Advise	A. Menopausal Rating System B. Medical and Nutrition Survey C. Stages of Change Survey D. 24 hour Diet Recall E. Food frequency Survey	Understanding of the topic	<ul style="list-style-type: none"> • Height • Weight • BMI • T3 • T4 • TSH • DEXA scan • Cholesterol • HDL • LDL • TG • Blood pressure

			M. Stress Evaluation Survey V. Consent Form and Authorization Forms		
3 Thyroid and bone health	Two: Remove noxious conditions	Thyroid and bone	O. Thyroid questionnaire Educational materials F and P.	Knowledge of hypothyroidism and bone demineralization	• Weight
5 Cardiovascular health	Two: Remove noxious conditions	Cardiovascular	Educational materials K., L., Q, R, S.	Knowledge of cardiovascular risks	• Weight
7 Brain and stress	Three: Rebalance and Heal	Brain and stress	Educational materials J. and N.	Knowledge of mood and depression	• Weight
9 Integumentary system and vasomotor events	Three: Rebalance and Heal	Integumentary and vasomotor	Educational materials G, H, I.	Knowledge of hair and skin care and sleep	• Weight
11 Reassess	Rebalance and Heal	Reevaluate	A. Menopausal Rating System Survey C. Stages of Change Survey D. 24 Hour Recall E. Food Frequency Survey M. Stress Evaluation Survey	Importance of diet and lifestyle, mindset and support.	<ul style="list-style-type: none"> • Height • Weight • BMI • T3 • T4 • TSH • DEXA scan • Cholesterol • HDL • LDL • TG • Blood pressure

Each bi-monthly session will be for a duration of 60-90 minutes. Support during the week will consist of e-mails, telephone calls and additional face-to-face sessions if necessary for encouragement and support.

From the initial menopausal symptom evaluation, the individual protocol for each participant will be derived based upon the schedule as shown in Table 1. The introduction letter and consent form will be given at the initial consultation appointment and the participant(s) will enter the program. Each participant will receive a personalized consultation on improved diet and lifestyle behaviors based on their physical condition and their responses to the forms and questionnaires and the generation of the nutrition analysis report. Study participants will be counseled to improve their intake of protein, calcium, vitamin D and lifestyle behaviors such as weight bearing exercise, reduced alcohol consumption and smoking cessation to help reduce risk of osteoporosis (Rizzoli et al., 2014). There may be additional dietary and lifestyle recommendations established on an individual basis depending on the needs of each participant. These may include recipe and lifestyle resources. The questionnaires will be evaluated, and the data collected before treatment and education and will be compared to the data collected after treatment and education.

CHAPTER FIVE-EXPECTED RESULTS

The many unfavorable physical and mental health changes that can occur during menopause may affect a woman's quality of life. The current program to improve menopausal symptoms titled, "10 Steps to Improve Menopausal Symptoms" targeting specific body systems that are adversely affected by hormonal changes has been developed. This program will endeavor to be a part of the solution by opening the dialogue and protocols for helping women address these challenges. Through the combination of education, recognition of stress triggers, and knowledge of whole food diet, exercise, and stress management, this program will motivate participants to change behavior and minimize the consequences of menopausal symptoms. Due to the complex emotional and biochemical aspects of a woman's experience, this program will also play a vital role as a support structure for participants. The targeted benefits of the program are therefore twofold: education and support.

Standard care of treatment to relieve menopausal symptoms often includes hormone replacement therapy (HRT), which are usually made of estrogen, progesterone and sometimes testosterone (Danby, 2005; Shekhar et al., 2017). However, results of studies have determined that women on HRT have a higher risks of developing heart disease, stroke, blood clots, abnormal bleeding, cancer and depression (Bhavnani, 2002). Depending on a woman's risk factors, HRT may not be an appropriate therapy thus there is a need for the implementation of diet and lifestyle changes to alleviate these symptoms is warranted.

It is expected that implementing the behavior changes resulting from the

educational component of the program will cause a shift in the participants' mental outlook and also improve confidence. Once participants have been exposed to a healthy diet, manage stress, it will enable them to make better choices for themselves. Also, focusing on physical cues for hunger, making food choices for both health and eating satisfaction, and not using food to cope with emotions is anticipated to help improve self esteem and maintain optimism.

Assessment of Success of Program

Individual evaluation, compliance and outcomes of the program will be based upon forms, surveys and questionnaires (Appendices A-H) completed before, during and after the twelve week program as described in the Methodology chapter. It is anticipated that different individuals will have different levels of success based upon their level of symptoms and motivational factors. Additionally, many of the assessment are self-reported by the participants which may be participant to incorrect self-evaluations. Statistical analysis will be applied to the quantitative values that are generated from the studies.

The educational component will be implemented as described in the Methodology chapter. Supporting handouts (Appendices I-S) for the participants to take home and study will be provided during the twelve week sessions.

Self-Efficacy, Stages of Change, Diet Improvements

Outcome measures on self-efficacy and stages of change will be achieved through the participants' self-reported readiness to change survey that is based upon the Trans-theoretical Model and the questions used in the survey (Appendix E) are from the original work of Prochaska (Prochaska, et al., 1994). Since these are self-reported value, there may will likely be some bias and inaccuracies.

Improvements in the diet will be quantitated based upon the participants' self-reported

food log and food frequency forms (Appendices B and C). The resulting Nutrient Analysis Reports that are generated during the six-week program will indicate positive or negative changes in the diet. Hopefully, a diet composed of fruits, vegetables, whole grains, low fat dairy, lean meats, fish, poultry, legumes, nuts and seeds which has most of the nutrients needed for bone, cardiovascular and brain health will result ("Mediterranean diet and cognitive decline in women with cardiovascular disease or risk factors," 2012). Additionally, since menopausal women often experience weight gain, particularly increased fat tissue of the abdominal area, the measurement of height and weight and abdominal circumference taken during the program (Appendix A) will indicate quantitative results.

Stress, Menopausal Symptoms and Physical Activity Improvements:

Research indicates that women who decrease weight and abdominal area measurement report fewer vasomotor symptoms of menopause (Davis et al., 2012). Hot flashes and night sweats occur because of the decrease in ovarian function. Disorder of the extremely controlled body temperature results in amplified heat loss reactions (Deecher & Dorries, 2007). Furthermore, methods to alleviate stress, vasomotor symptoms and improve health, in general, have been shown to be improved by exercise. Both aerobic and strength training exercise will be discussed in the program and is fundamental to improve bone, muscle mass and strength in menopausal women. Results of research have demonstrated that regular physical activity at 30 minute intervals 2- 3 days per week improves vasomotor symptoms of menopause, improved blood pressure and lipid profiles, blood glucose control, weight and mood (Fogleman, 2012; Hagey & Warren, 2008; Mishra et al., 2011) along with aerobic and strength training activities such as walking, swimming. Assessment of changes in these parameters will be evaluated by the self-reported symptom and stress relief surveys (Appendices D, F and G) will capture these results.

CHAPTER SIX- DISCUSSION, CONCLUSIONS AND FUTURE DIRECTIONS

Although menopause is a natural part of aging, health concerns women face due to menopause have become important for a more productive life. This is because women are living much longer today, at an average of 81 years as compared to 40 years in the 1900's ("Life expectancy at birth (in years) by gender," 2018). Women who go through menopause have very low levels of the sex hormones. During menopause estrogen decreases as it is made only in small amounts by fat tissue and the adrenal glands. Progesterone and testosterone also decrease. The resulting decrease in sex hormones creates an imbalance in the body, which raise risk for heart disease and osteoporosis ("The hormones that cause menopause," ND; Leuzzi, Marzullo, & Modena, 2012; Rizzoli, Bischoff-Ferrari, Dawson-Hughes, & Weaver, 2014; Shekhar, Travis, He, Roman, & Fan, 2017). There is also an increased risk of developing hypothyroidism during menopause. This may be due to decreased estrogen production, which negatively impacts FSH, LH, T3 and T4 levels (Northrup, 2012). Menopausal women may also experience mood swings, brain fog, hot flashes and night sweats, sleep disturbances, cognitive function decline, heart palpitations, fatigue, anxiety, depression, weight gain, hair loss and decreased sexual drive (Brzezinski, 2019; Davis et al., 2012; Richardson & Robinson, 2000; Stuenkel et al., 2015; Woods & Mitchell, 2010).

Endocrine disrupting compounds have been linked to earlier age of menopause (Schmidt, 2017). Endocrine disrupters mimic or block effects of hormones by stimulating or inhibiting hormone production by the endocrine system. Common disrupters are found in plastics,

pesticides, medications and food. These disrupters negatively impact thyroid function, weight, and influence insulin production (Diamanti-Kandarakis et al., 2009; Extance, 2015).

A 3-step approach will be used to alleviate menopausal symptoms. The first stage will consist of evaluating and setting goals to reduce noxious agents from both the body and the environment. The second stage will focus on removing existing factors from the body that may be creating an imbalance. In the third stage, a healthy diet, physical activity and healthy lifestyle practices will rebalance and heal the body. The 10 targeted areas that will be addressed using the 3 steps include assessment, advisement, thyroid, bone, cardiovascular, brain function, stress, integumentary and vasomotor. Finally, there will be a re- evaluation.

The aim of this project was to develop an innovative diet and lifestyle treatment program, the “10 Steps to Improve Menopausal Symptoms” in order to alleviate menopausal symptoms thus reduce a women’s dependence on pharmaceuticals. This is a 12-week program to target specific body symptoms adversely affected by hormonal change. This program may improve quality of life and reduce possible harmful effects and financial obligation of pharmaceuticals.

With increased risk for HRT, the possible role for a diet and lifestyle program may be of increased interest. HRT is made of estrogen, progesterone and sometimes testosterone. The Women’s Health Initiative Study found that there was an increased risk of heart disease, stroke, blood clots, abnormal bleeding, cancer and depression in women taking HRT (Bhavnani, 2002). Depending on a woman’s risk factors, HRT may not be an appropriate treatment.

Measurements used to assess menopausal symptoms will be obtained via the Menopausal Rating Scale (MRS), which will indicate symptoms such as mood swings, fatigue, hair loss, heart palpitations, vasomotor symptoms, decreased sexual drive, weight gain, depression and anxiety. Physiological assessments such as height, weight, BMI will be obtained by the clinician. Other

parameters to measure thyroid function, bone health, and heart health will also be evaluated. These will include T3, T4, TSH, DEXA scan, cholesterol, High Density Lipoprotein (HDL), Low Density Lipoprotein (LDL), triglyceride and blood pressure. These measurements will be obtained from each participant's medical chart. The anticipated outcome of this research is that women reduce or possibly eliminate menopausal symptoms such as mood swings, fatigue, hair loss, heart palpitations, hot flashes, night sweats, decreased sexual drive, weight gain, depression and anxiety.

The expected beneficial results of the “10 Steps to Improve Menopausal Symptoms” are based upon results of several studies. In one cross sectional study, Park et al found women who had increased intakes of fish, seaweed and vegetable oils had decreased vasomotor complaints. The researchers also found decreased vasomotor symptoms in those consuming high intakes of green and yellow vegetables, decreased caffeine and processed foods intake (Park et al., 2003). In a randomized control study of 483 women investigating omega 3 fatty acid supplementation, it was found that those taking supplementation also had a decrease in hot flashes and night sweats (Mohammady, Janani, Jahanfar, & Mousavi, 2018). The United Kingdom Women's Cohort Study investigated the link between diet and age of menopause and concluded that daily intakes of fatty fish or fresh legumes, B6 and zinc could delay age of onset of menopause. It was found that women eating a diet rich in pasta and rice experienced menopause, on average 1 ½ years earlier as compared to those women who did not (Dunneram, Greenwood, Burley, & Cade, 2018).

In a similar study by Nazari et al, 200 postmenopausal women were evaluated to see if lifestyle education could be effective in reducing menopausal symptoms and it was discovered that this could be an appropriate therapy to reduce symptoms and improve health (Nazari, Farmani, Kaveh, & Ghaem, 2016). Similarly, in a study of 261 women, Gorantis et al concluded

aerobic exercise contributed to a decrease in vasomotor symptoms as well as a small gain in quality of life (Goranitis et al., 2017). Another study investigated if a sedentary lifestyle contributed to increased menopausal symptoms and obesity in menopausal women. It was shown that those women who were inactive reported more severe menopausal symptoms as well as more depression, anxiety, sleep disturbances and increased waist circumference (Blumel et al., 2016). Based upon these published studies, diet and lifestyle intervention may be a cost effective solution for alleviating menopausal symptoms and reducing the need for pharmaceuticals.

Limitations

One limitation of this program is that it is targeted at women who are of sufficient economic status to pay for and have the time to participate in this twelve-week program. Obviously, women in lower socio-economic status may also have the same issues but cannot afford to attend such a program. Hopefully with more wide spread knowledge in this area, more educational programs may be implemented to accommodate these women. By offering a supportive environment in which women become educated about factors that will improve their health and well being, the program will play an important part in increasing understanding of the prevalence of adverse menopausal symptoms and the need to address it. Other limitations include information bias, as the information collected is self reported, as well as interviewer bias as the researcher will be the only clinician conducting the sessions. Additionally, surveys that are self-reported by the participant may be subject to poor recall. Another weakness is that individuals may move back and forth from desired change and may be tempted to indulge in unhealthy behavior if exposed to a stressful event.

Future Directions

To investigate further that healthy diet and lifestyle practices may reduce or eliminate menopausal symptoms, future studies should include:

- Larger number of participants
- Longer duration of study
- Recording cultural differences in participants
- Recording socioeconomic status of participants

Additionally, working closely with a health practitioner and in order to monitor physiological functions during the study time frame would be productive to more fully assess the participant's health. This would also reduce any potential bias that the researcher may have since the current proposed study is based upon clients from the researcher's private practice as a registered dietitian.

APPENDIX A- Menopausal Rating Scale (MRS)

WHICH OF THE FOLLOWING SYMPTOMS APPLY TO YOU AT THIS TIME? PLEASE MARK THE APPROPRIATE BOX FOR EACH SYMPTOM. FOR SYMPTOMS THAT DO NOT APPLY, PLEASE MARK "NONE".

NONE _____ MILD _____ MODERATE _____ SEVERE _____ VERY SEVERE
SCORE= 1 2 3 4 5

SYMPTOMS:

1. HOT FLASHES, SWEATING, EPISODES OF SWEATING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. HEART DISCOMFORT, UNUSUAL AWARENESS OF HEART	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. SLEEP PROBLEMS, DIFFICULTY FALLING ASLEEP, SLEEPING THROUGH NIGHT, WAKING UP EARLY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. DEPRESSIVE MOOD, FEELING DOWN, SAD, ON THE VERGE OF TEARS, LACK OF DRIVE, MOOD SWINGS	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. IRRITABILITY, BEING NERVOUS, INNER TENSION, FEELING AGGRESSIVE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. ANXIETY, INNER REST- LESSNESS, FEELING PANICKY	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WHICH OF THE FOLLOWING SYMPTOMS APPLY TO YOU AT THIS TIME? PLEASE MARK THE APPROPRIATE BOX FOR EACH SYMPTOM. FOR SYMPTOMS THAT DO NOT APPLY, PLEASE MARK "NONE".

NONE _____ MILD _____ MODERATE _____ SEVERE _____ VERY SEVERE
 SCORE= 1 2 3 4 5

7. PHYSICAL AND
MENTAL EXHAUSTION,
GENERAL DECREASE
IN PERFORMANCE, IMPAIRED
MEMORY,
DECREASE IN
CONCENTRATION,
FORGETFULNESS, ☐ ☐ ☐ ☐ ☐

8. SEXUAL PROBLEMS,
CHANGE IN SEXUAL
DESIRE, IN SEXUAL ACTIVITY,
AND SATISFACTION, ☐ ☐ ☐ ☐ ☐

9. BLADDER PROBLEMS,
DIFFICULTY IN URINATING,
INCREASED NEED TO
URINATE, BLADDER
INCONTINENCE ☐ ☐ ☐ ☐ ☐

10. DRYNESS OF VAGINA,
SENSATION OF DRYNESS OR
BURNING ☐ ☐ ☐ ☐ ☐

11. JOINT AND MUSCULAR
DISCOMFORT, PAIN IN JOINTS,
RHEUMATOID COMPLAINTS ☐ ☐ ☐ ☐ ☐

APPENDIX B- Medical Survey

NAME _____ MIDDLE _____ LAST _____
ADDRESS _____
EMAIL _____ TELEPHONE _____
BIRTHDATE _____ AGE _____
PRIMARY
DOCTOR _____ ADDRESS _____
EMPLOYER _____ OCCUPATION _____
PRIMARY INS CARRIER NAME AND DOB _____

MEDICAL
REASON FOR NUTRITIONAL COUNSELING _____
CURRENT DX IF APPLICABLE _____
CURRENT MDICATIONS _____
VIT/MIN SUPPLEMENTS _____
MEDICAL HX _____
FAMILY MED HX _____
PERTINENT LABORATORY VALUES _____

HT _____ WT _____ USUAL _____ HIGHEST _____ LOWEST _____
BMI _____

LIFESTYLE
EXERCISE _____
TOBACCO _____ ALCOHOL _____

DIET
FOOD ALLERGIES/SENSITIVITIES _____
WHO PREPARES MEALS _____
DO YOU COOK AT HOME OR EAT OUT MORE OFTEN _____
HAVE YOU EVER BEEN ON A DIET BEFORE. WHICH ONES _____
WHAT IS YOUR TYPICAL EATING ENVIRONMENT LIKE _____

ARE YOU CURRENTLY EXPERIENCING ANY OF THE FOLLOWING (CIRCLE):

APPETITE CHANGES CHEWING SWALLOWING

CONSTIPATION DIARRHEA

INDIGESTION SUDDEN WEIGHT CHANGE

RATE YOUR CURRENT LEVEL OF STRESS ON A SCALE 1-5 (1 LOWEST/ 5
HIGHEST) _____

ADDITIONAL QUESTIONS

What are one or two things you would like to change about your diet?

What eating habits are you most proud of?

What eating habits need the most improvement?

What was your health like before this problem began?

What impact have your symptoms had on your life?

What was your diet like as a child/teen,etc.?

At work or at home are you exposed to any chemicals? Examples ?

APPENDIX C- Stages of Change Survey

Name: _____

Date: _____

Menopausal Readiness-to-Change Lifestyle Behavior

Indicate the readiness of the patient towards making changes/improvements in the lifestyle behaviors listed below by using this 5-point scale.

Rating Readiness-to-change

- | | |
|---|---|
| 5 | No interest in this lifestyle behavior at this time |
| 4 | Thinking about implementing this lifestyle behavior sometime in the next few months |
| 3 | Plan to implement this lifestyle behavior sometime in the next month |
| 2 | Recently (within the previous 6 months) began this lifestyle behavior |
| 1 | Have been maintaining this lifestyle behavior for 6+ months |
-

Rating Lifestyle behavior

_____ Purposeful exercise at least 5 times per week

Incorporate “extra” physical activity throughout the daily routine (“extra” = taking stairs rather than elevator, walking pets, parking further away in parking lot, etc.)

_____ Eat 5 or more servings of fruits and vegetables daily

_____ Consistently choose foods with whole grains

_____ Choose foods high in fiber

_____ Choose foods rich in calcium

_____ Choose foods rich in Omega 3 Fatty Acids

_____ Choose foods rich in Vitamin D

- _____ Choose foods rich in protein
- _____ Lose or maintain body weight
- _____ Avoid smoking or tobacco use
- _____ Implement specific strategies to help with lifestyle modifications
- _____ Engage in stress relief activities
- _____ Live an overall healthy lifestyle.

24 Hour Diet Recall

Day 1

Where

[illegible]

APPENDIX E- Food Frequency Survey

Food Frequency Questionnaire - How often do you eat the following?						
Food	Never or <4x/year	Rarely or <4x/month	Once/wk	2x/wk	3x/wk	Daily
Cheese	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yogurt, Kefir	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cow's Milk	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Milk Substitute (soy, coconut, almond, rice, or hemp seed milk)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Red Meat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pork (pork loin, pork roast, pork chops, barbecue)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Processed Meat (sausage, bacon, lunch meat)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chicken	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Eggs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cold Water Fish (<i>striped bass, wild Alaskan salmon, herring, sardines, anchovies, mackerel, Alaskan halibut, Alaskan cod</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other fish or shellfish- Indicate type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Beans, Legumes (black beans, kidney beans, white beans, lentils)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whole Soy Foods (edamame, soy nuts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tofu, Tempeh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Soy "meat alternative" (ex. Tofurkey, soy "sausage", soy "bacon")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Berries	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Fruits- Indicate type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cruciferous Vegetables (cabbage, broccoli, Brussels sprouts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Green Leafy Vegetables (e.g. spinach, kale, collards, greens)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Yellow Fruits and Vegetables (e.g. yellow peppers, corn)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Green Fruits and Vegetables (e.g. peas, broccoli, avocado, cucumbers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Blue/Purple Fruits and Vegetables (e.g. blueberries, prunes, beets, purple cabbage)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Red Fruits and Vegetables (e.g. cherries, apples, tomatoes, kidney beans)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Orange Fruits and Vegetables (e.g. orange, cantaloupe, carrots, sweet potato)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
White/Tan Fruits and Vegetables (e.g. onions, garlic, ginger, nuts)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Turmeric, Cumin, Ginger, Rosemary, Oregano, Parsley	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Nuts, Nut Butters- Indicate type:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Avocado, Extra Virgin Olive Oil , Canola Oil	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetable oil (corn, sunflower, safflower, etc. - NOT olive oil)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Butter, ghee	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
White Rice	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
White Pasta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
White Bread	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bagels	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
English Muffins	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pancakes or Waffles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

APPENDIX F- Calcium Rich Foods



Prepared For:		Date:	
Prepared By:	Vicki Goodman	Contact:	215 920 4656 vwgoodman@gmail.com

High-Calcium Foods List

How Much Do You Need?

- Healthy adults between the ages of 19 and 50 should aim for 1,000 milligrams (mg) calcium per day.
- Older adults (especially women after menopause) need more calcium, because bones lose calcium as we age. After age 50, healthy adults should get 1,200 mg calcium per day.

Foods Recommended

300 mg Calcium per Serving

- 1 cup milk (fat free, low fat, chocolate, and buttermilk)
- 1 cup nonfat or low-fat yogurt
- 1 cup calcium-fortified soy milk or rice milk
- 1 cup calcium-fortified orange juice
- 1½ oz low-fat natural cheese (such as cheddar, mozzarella, or Swiss)
- 2 oz processed cheese (such as American)
- 1 cup ready-to-eat pudding
- 1 cup macaroni and cheese

200 mg Calcium per Serving

- 3 oz canned salmon (with soft bones)
- 3 oz sardines (with soft bones)
- 1 cup calcium-fortified cereal
- 1 oz feta cheese

APPENDIX G- Protein Content of Various Foods

winning the war with

handout 1.1

PROTEIN CONTENT OF VARIOUS FOODS

Food Item	Serving Size	Protein (gm)
Meat Group:		
Chicken breast	½	18
Hamburger	3 oz	21
Salmon	3 oz	22
Shrimp	15 large	18
Grains:		
Rice, cooked	½ cup	3
Pasta, cooked	1 cup	7
Bread, wheat	1 slice (1oz)	3
Bagel	1	6
Cereal, flakes	1 oz (¾ cup)	3
Fruits:		
Apple	1 med	--
Banana	1 med	1
Orange	1 med	1
Dairy:		
Milk, skim	8 oz	8
Milk, 2%	8 oz	8
Cheese, American	1 oz	6
Cheese, cottage	1 cup	28
Frozen yogurt, soft-serve	1 cup	6
Yogurt, refrigerated, fruit	1 cup	11
Beans:		
Kidney beans, canned	½ cup	6
Lentil soup	1 cup	9
Bean burrito	1	7
Chili	1 cup	11
Vegetables:		
Carrots, raw	1 med	1
Potato, baked with skin	1 large	5
Broccoli, cooked	½ cup	2
Peas, cooked	½ cup	4

Compiled from: Pennington JA. *Bowes and Church's Food Values and Portions Commonly Used*, 16th ed. Philadelphia, PA. J.B. Lippincott Company; 1994.

20853

APPENDIX H- High Fiber Foods List

edf
ghl Association

Client Name _____ Date _____
RD/DTR Vicki Goodman
Email vwgoodman@gmail.com Phone 215 920 4656

List of Foods High in Fiber

How Much Do You Need?

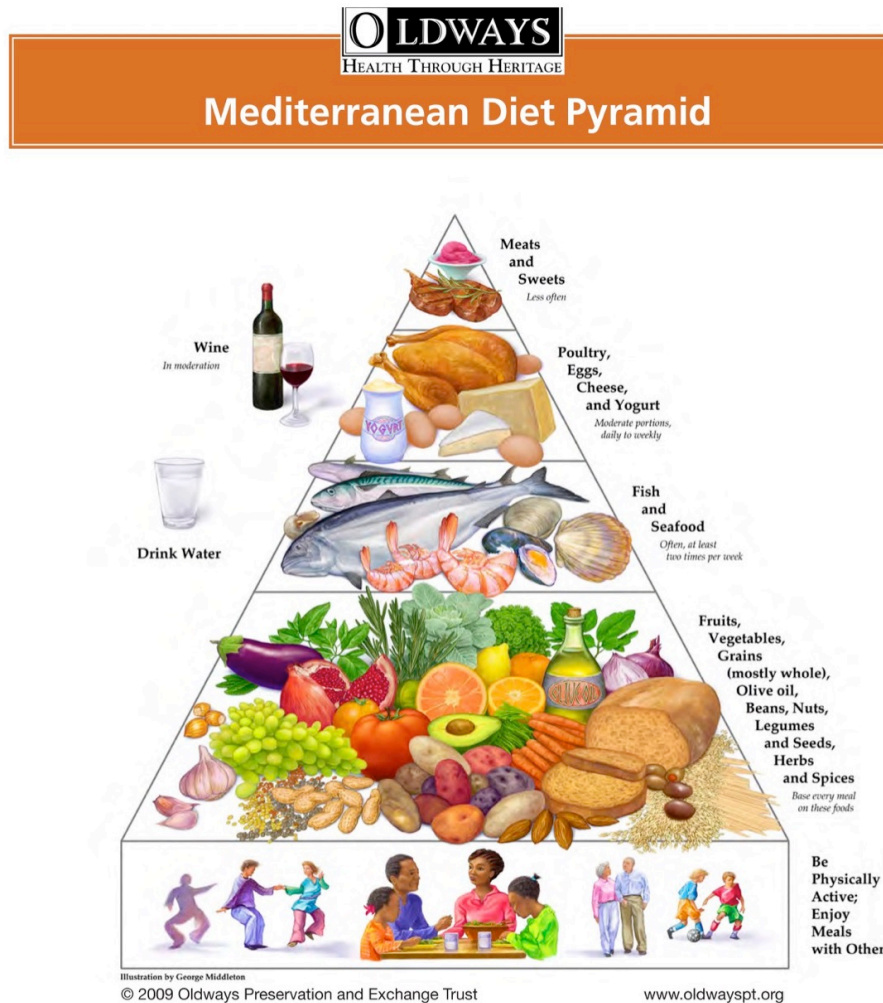
The daily recommendations for most healthy adults:

- Men ages 50 years and younger: 38 grams fiber per day
- Men ages 51 years and older: 30 grams fiber per day
- Women ages 50 years and younger: 25 grams fiber per day
- Women ages 51 years and older: 21 grams fiber per day

Food	Amount	Total Fiber (grams)
Bran cereal	1/3 cup	8.6
Cooked kidney beans	1/2 cup	7.9
Cooked lentils	1/2 cup	7.8
Cooked black beans	1/2 cup	7.6
Canned chickpeas	1/2 cup	5.3
Baked beans	1/2 cup	5.2
Pear	1	5.1
Soybeans	1/2 cup	5.1
Quinoa	1/2 cup	5
Baked sweet potato, with skin	1 medium	4.8
Baked potato, with skin	1 medium	4.4
Cooked frozen green peas	1/2 cup	4.4
Bulgur	1/2 cup	4.1
Cooked frozen mixed vegetables	1/2 cup	4
Raspberries	1/2 cup	4
Blackberries	1/2 cup	3.8
Almonds	1 ounce	3.5
Cooked frozen spinach	1/2 cup	3.5
Vegetable or soy patty	1 each	3.4
Apple	1 medium	3.3
Dried dates	5 pieces	3.3

Copyright © American Dietetic Association. This handout may be duplicated for client education.
List of Foods High in Fiber – Page 1

APPENDIX I- Mediterranean Food Pyramid



APPENDIX J- Foods Rich In Omega 3 Fatty Acids

FISH AND SEAFOOD

- HALIBUT
- HERRING
- MACKERAL
- OYSTERS
- SALMON
- TUNA
- TROUT
- SARDINES
- ANCHOVIES

NUTS AND SEEDS

- ALMONDS
- WALNUTS
- FAXSEEDS
- CHIA SEEDS
- PUMPKIN SEEDS

FRUIT AND DAIRY FORTIFIED WITH OMEGA 3

- EGGS
- MARGERINE
- JUICE
- SOY MILK
- MILK
- YOGURT

VEGETABLES

- BRUSSEL SPROUTS
- BROCCOLI
- CAULIFLOWER
- KALE

FATS

- AVOCADO
- EXTRA VIRGIN COLD PRESSED OLIVE OIL
- CANOLA OIL
- FLAXSEED OIL
- WALNUT OIL

APPENDIX K- Heart Health For Women



**Sports,
Cardiovascular,
and Wellness
Nutrition**
a dietetic practice group of the
Academy of Nutrition
and Dietetics
**eat
right.**

Heart Health for Women

Heart disease is the leading cause of death among women in the United States (US). Coronary heart disease (CHD) is the most common type and is largely preventable. Healthy lifestyle factors are associated with significant reduction in CHD risk. For women age 55 and older and/or with family history of CHD, the risk increases but there are important actions that you can take to greatly reduce your risk for CHD.

Adopting these lifestyle factors can help lower your risk:

Factor 1: Quit Smoking/ Tobacco Use and Avoid Secondhand Smoke

Goal: Get support to quit from your health care provider as well as family, friends, and trained counselors to help you quit for good. Giving up tobacco is not easy, but it is one of the best things you can do for your health.

- Quit Smoking Programs: call the American Lung Association's toll-free Lung HelpLine at **1-800-LUNG-USA** to speak with a counselor or visit **www.lung.org** to submit a question or to chat with a counselor on-line. For a step-by-step plan, consider enrolling in the Freedom From Smoking® online smoking cessation program at **www.ffsonline.org**.
- Each state has its own quitline. Find services offered by calling **1-800-QUIT-NOW** or by visiting the North American Quitline Consortium map page and clicking on your state (**http://www.naquitline.org/?page=mappage**).

- Keep healthy snacks on hand and plan for alternative activities such as walking to occupy times of craving. Try moderate amounts of air-popped popcorn, grape tomatoes, baby carrots, raisins, rice cakes, fresh kiwi, thin unsalted pretzel sticks, or grapes.

Factor 2: Follow a Varied, Nutrient-rich Diet

Goal: Choose a dietary pattern that emphasizes vegetables, fruits, and whole grains; includes low-fat dairy products, lean meats, poultry, fish, legumes, non-tropical vegetable oils and nuts; and limits sweets, sugar-sweetened beverages and processed and fatty meats.

- Eat a colorful variety of fruits and vegetables every day to get a wide range of protective nutrients. For example, mix salad greens with tomatoes, sliced cucumbers, red onions, and bell peppers.
- Choose whole grains—they provide more dietary fiber than processed grains—which can help lower cholesterol levels. Whole grain sources include whole wheat, spelt, bulgur, amaranth, whole-grain barley, buckwheat, oats, brown rice, quinoa, whole rye, and popcorn.

- Select foods high in omega-3 fatty acids, a type of polyunsaturated fat. Examples include fatty fish* (salmon, mackerel, herring, lake trout, sardines and albacore tuna) and nuts like walnuts.



- Choose fat-free or low-fat dairy products like milk and yogurt.

- Eat plant-based foods that contain dietary fiber like whole grains, fruits, vegetables, nuts, and especially legumes (peanuts, lentils, kidney and pinto beans, etc.).



- Choose dark leafy greens (kale, Swiss chard, collards, mustard greens, spinach), asparagus, avocados and peas. These foods are rich sources of folate and add color and flavor to meals.

- Limit sources of sodium such as canned soups, processed meats (bacon, sausage, luncheon meats), and other processed and restaurant foods.

- Limit sugar-sweetened beverages and snack choices.

** Women who are pregnant, nursing, or who could become pregnant, as well as young children, should avoid king mackerel, marlin, orange roughy, shark, swordfish, tilefish (Gulf of Mexico), and bigeye tuna due to higher levels of mercury. Check local advisories before eating locally-caught fish. For more information, visit www.epa.gov/fishadvice.*

APPENDIX L- Choose Heart Healthy Snacks

Heart Healthy Snacking Ideas

When a snack attack strikes, refuel with these nutrition-packed snacks.

Easy, Tasty (and Healthy) Snacks

You may need an adult to help with some of these snacks.

1. Peel a banana and dip it in yogurt. Roll in crushed cereal and freeze.
2. Spread celery sticks with peanut butter or low-fat cream cheese. Top with raisins. Enjoy your “ants on a log.”
3. Stuff a whole-grain pita pocket with ricotta cheese and Granny Smith apple slices. Add a dash of cinnamon.
4. Mix together ready-to-eat cereal, dried fruit and nuts in a sandwich bag for an on-the-go snack.
5. Smear a scoop of frozen yogurt on two graham crackers and add sliced banana to make a yummy sandwich.
6. Top low-fat vanilla yogurt with crunchy granola and sprinkle with blueberries.
7. Microwave a small baked potato. Top with reduced-fat cheddar cheese and salsa.
8. Make snack kabobs. Put cubes of low-fat cheese and grapes on pretzel sticks.
9. Toast a whole grain waffle and top with low-fat yogurt and sliced peaches.
10. Spread peanut butter on apple slices.
11. Blend low-fat milk, frozen strawberries and a banana for thirty seconds for a delicious smoothie.
12. Make a mini-sandwich with tuna or egg salad on a dinner roll.
13. Sprinkle grated Monterey Jack cheese over a corn tortilla; fold in half and microwave for twenty seconds. Top with salsa.
14. Toss dried cranberries and chopped walnuts in instant oatmeal.
15. Mix together peanut butter and cornflakes in a bowl. Shape into balls and roll in crushed graham crackers.
16. Microwave a cup of tomato or vegetable soup and enjoy with whole grain crackers.
17. Fill a waffle cone with cut-up fruit and top with low-fat vanilla yogurt.
18. Sprinkle grated Parmesan cheese on hot popcorn

- 19.** Banana Split: Top a banana with low-fat vanilla and strawberry frozen yogurt. Sprinkle with your favorite whole-grain cereal.
- 20.** Sandwich Cut-Outs: Make a sandwich on whole grain bread. Cut out your favorite shape using a big cookie cutter. Eat the fun shape and the edges, too!
- 21.** Spread mustard on a flour tortilla. Top with a slice of turkey or ham, low-fat cheese and lettuce. Then roll it up.
- 22.** Mini Pizza: Toast an English muffin, drizzle with pizza sauce and sprinkle with low-fat mozzarella cheese.
- 23.** Rocky Road: Break a graham cracker into bite-size pieces. Add to low-fat chocolate pudding along with a few miniature marshmallows.
- 24.** Inside-Out Sandwich: Spread mustard on a slice of deli turkey. Wrap around a sesame breadstick.
- 25.** Parfait: Layer vanilla yogurt and mandarin oranges or blueberries in a tall glass. Top with a sprinkle of granola.

Dip it! Bonus Snacks

- Dip baby carrots and cherry tomatoes in low-fat ranch dressing.
- Dip strawberries or apple slices in low-fat yogurt.
- Dip pretzels in mustard.
- Dip pita chips in hummus.
- Dip graham crackers in applesauce.
- Dip baked tortilla chips in bean dip.
- Dip animal crackers in low-fat pudding.
- Dip bread sticks in salsa.
- Dip a granola bar in low-fat yogurt.

APPENDIX M- Stress Relief Survey

Perceived Stress Scale

A more precise measure of personal stress can be determined by using a variety of instruments that have been designed to help measure individual stress levels. The first of these is called the **Perceived Stress Scale**.

The Perceived Stress Scale (PSS) is a classic stress assessment instrument. This tool, while originally developed in 1983, remains a popular choice for helping us understand how different situations affect our feelings and our perceived stress. The questions in this scale ask about your feelings and thoughts during the last month. In each case, you will be asked to indicate how often you felt or thought a certain way. Although some of the questions are similar, there are differences between them and you should treat each one as a separate question. The best approach is to answer fairly quickly. That is, don't try to count up the number of times you felt a particular way; rather indicate the alternative that seems like a reasonable estimate.

For each question choose from the following alternatives:

~~1~~ - never ~~2~~ - almost never ~~3~~ - sometimes ~~4~~ - fairly often ~~5~~ - very often

- _____ 1. In the last month, how often have you been upset because of something that happened unexpectedly?
- _____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?
- _____ 3. In the last month, how often have you felt nervous and stressed?
- _____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?
- _____ 5. In the last month, how often have you felt that things were going your way?
- _____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?
- _____ 7. In the last month, how often have you been able to control irritations in your life?
- _____ 8. In the last month, how often have you felt that you were on top of things?
- _____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?
- _____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

APPENDIX N- Stress Management Techniques

Stress Management Techniques

To manage the effects of the stress response ('fight-or-flight') on your body.

In the Moment Techniques

1. Deep Breathing:

Deep breathing is a simple but very effective method of relaxation. It works well in conjunction with other relaxation techniques such as Progressive Muscular Relaxation, relaxation imagery and meditation to reduce stress.

To use the technique, take a number of deep breaths and relax your body further with each breath. That's all there is to it!

2. Abdominal breathing or 3-part breathing:

Place hands on belly. Hands should go out with your belly on inhale, in on the exhale. Repeat until feeling relaxed.

Alternative: start with abdomen and expand to chest and shoulders, then reverse on exhale.

3. Breath Counting

It may be helpful to **count** on inhale and exhale: 5 seconds of inhale
5 seconds of exhale

OR

4/7/8 Inhale for 4 seconds, hold for 7 seconds, exhale for 8 seconds

• **Freeze-Frame! Technique** from the book *Transforming Stress* by Doc Childre *this takes some practice and works great for people that are able to visualize well (great for worriers!)*

Step 1 SEE and PAUSE: Recognize the stressful feeling, see it-visualize it, and then pause it, like pushing the **Pause** button on your DVD or taking a time-out!

Step 2 HEART BREATH: Take a deep breath. Make a sincere effort to **Shift** your focus away from the racing mind or disturbed emotions to the area around your heart. Pretend you've breathing through your heart to help focus your energy in this area. Keep your focus there for ten second or more.

Step 3 RECALL and FEEL: Recall a positive, fun feeling or time you've had in your life and attempt to re-experience it. Focus on the feeling rather than the thoughts or visual image. **Activate** the positive emotion.

OPTIONAL **Step 4** Using your intuition, common sense and sincerity **Ask** your heart, what would be a more efficient response to the situation you are Freeze-Framing, one that will minimize future stress?

OPTIONAL **Step 5 Listen** to what your heart says in answer to your question. *Compiled by Ben Brown, MD.*

Technique for Physical Tension

Progressive Muscular Relaxation (PMR):

Progressive Muscular Relaxation is useful for relaxing your body when your muscles are tense.

The idea behind PMR is that you tense up a group of muscles so that they are as tightly contracted as possible. Hold them in a state of extreme tension for a few seconds. Then, relax the muscles to their previous state. Finally, consciously relax the muscles even further so that you are as relaxed as possible.

By tensing your muscles first, you will probably find that you are able to relax your muscles more than would be the case if you tried to relax your muscles directly.

Experiment with PMR by forming a fist, and clenching your hand as tight as you can for a few seconds. Then relax your hand to its previous tension, and then consciously relax it again so that it is as loose as possible. You should feel deep relaxation in your hand muscles.

For maximum relaxation you can use PMR in conjunction with breathing techniques and imagery.

Technique for Racing Mind

The “Relaxation Response”:

Try the following 6-step relaxation response from the book called “The Relaxation Response,” by Dr. Herbert Benson the next time you feel anxiety or stress:

Sit quietly in a comfortable position. Close your eyes.

Deeply relax all of your muscles, beginning at your feet and progressing up to your face. Keep your muscles relaxed.

Breathe through your nose. Become aware of your breathing. As you breathe out

(exhale), say the word, “ONE”, silently to yourself. For example: breathe IN...OUT, “ONE”, -IN...OUT, “ONE”, etc. Breathe easily and naturally.

Continue for 10 to 20 minutes (depending on your schedule). You may open your eyes to check the time, but do not use an alarm. When you finish, sit quietly for several minutes, at first with your eyes closed, then with your eyes opened. Do not stand up for a few minutes.

Do not worry about if you are successful in achieving a deep state of relaxation. When distracted, simply return to repeating “ONE.”

Besides relying on this technique a few times each day, I recommend using it to get to sleep at night, especially after a long, hard day or before a tough next day. It’s simple, It can fit it in to your day when needed.

APPENDIX O- Thyroid Questionnaire

THYROID QUESTIONNAIRE

This questionnaire helps you determine the function of thyroid hormone in your body. It does not matter if you have had lab tests that say your thyroid is OK or that you may be taking prescription thyroid medication, you still may have problems with metabolism that directly relates to how thyroid hormone is functioning in your body.

Scoring: in front of each question enter the following score:

5- If this is a severe problem

4- If this is a noticeable issue or significant problem

3- If this is a problem, but not a major issue

2 – If this happens every now and then, but you don't notice it too much

1 – If you seldom or never have this issue.

_____ 1) Are you cold (cold hands/feet)?

_____ 2) Do you have a swelling in the neck area?

_____ 3) Are you overweight?

_____ 4) Can you eat very little and still not lose weight (or you gain weight too easily)?

_____ 5) Are you tired all the time?

_____ 6) Do you wake up with headaches/heavy head that wears off as the day progresses?

_____ 7) Do you always need a lot of sleep, and even then you don't feel well rested?

_____ 8) If you sit down during the day do you get tired (energy drops when you stop moving)?

_____ 9) Does your energy significantly drop in the afternoon?

_____ 10) Do you rely on caffeine, nicotine, or some other stimulant to keep your energy going?

_____ 11) Are your moods noticeably worse with your menstrual cycle or transition?

_____ 12) Are you prone to depression in the fall or spring?

_____ 13) Does your head feel heavy (and/or your memory/concentration is noticeably declining)?

_____ 14) Is the outside portion of your eyebrows thinning (or gone)?

_____ 15) Do you have dry skin and/or dry hair?

_____ 16) Do you have rough patches of skin on your elbows?

_____ 17) Is your hair falling out (or less body hair in general: head, legs, arms, eyelids, eyebrows)?

_____ 18) Are you prone to constipation (including having to strain to eliminate)?

_____ 19) Do you have numbness in your extremities or have carpal tunnel syndrome?

- _____ 20) Are you prone to facial fluid retention, especially around the eyes?
_____ 21) Is your voice hoarse or coarse?
_____ 22) Do you get muscle cramps or have general muscle weakness?
_____ 23) Do you have high or low cholesterol?

_____ Total

If your total score is over 100 you have a significant metabolism problem. Thyroid hormone is not working in a proper manner. Thyroid issues are causing other health problems.

If your score is in the 50-100 ranges, you have a noticeable metabolism problem. Thyroid hormone function in your body is struggling. Steps need to be taken to prevent health issues from magnifying.

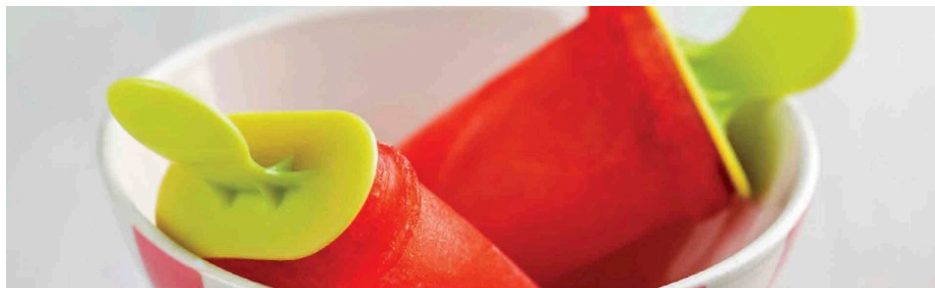
If your score is in the 20-49 ranges, you are showing signs of metabolism wear and tear. The higher your score in this range the greater the need to take preventive steps to keep your health on track.

If your score is under 20, your metabolism is in good condition.

APPENDIX P- Reduce Toxic Load

1. CONSUME WHOLE, FRESH AND UNPROCESSED FOODS
2. EAT ORGANIC
3. CONSUME COLORFUL FRUITS AND VEGETABLES
4. EAT PLENTY OF FOODS HIGH IN FIBER
5. UTILIZE HEPA/ULPA FILERS IN THE HOME AND WORK PLACE
6. KEEP LOTS OF HOUSEPLANTS IN YOUR HOME AND AT WORK
7. TAKE PLASTIC OFF DRY CLEANING AND HANG CLOTHES OUTSIDE OR IN GARAGE 1-3 DAYS BEFORE WEARING
8. REDUCE MICROWAVE USE AND USE LEAD FREE GLASS TO HEAT FOODS
9. AVOID PLASTIC BOTTLES
10. AVOID PERSONAL PRODUCTS AND MEDICATIONS CONTAINING ALUMINUM
11. AVOID UNNECESSARY EXPOSURE TO SECOND HAND SMOKE, CAR EXHAUST, AND CHEMICALS IN CLEANING AND GARDEN SUPPLIES
12. DUST AND VACUUM OFTEN

APPENDIX Q- Healthy Snacking For Smoking Cessation



**Sports,
Cardiovascular,
and Wellness
Nutrition**
a science practice group of the
Academy of Nutrition
and Dietetics

Healthy Snacking for Smoking Cessation

On average, smokers gain 4–10 pounds when they quit. People often replace their smoking rituals with snacking because of the oral gratification and the returned sensitivity of taste and smell. Next time you have a craving, try to wait 5 minutes or find an alternative activity. Usually the craving will pass, but if you can't beat it, try one of these low-calorie snacks instead!

Snacks under 50 Calories

	Calories
1½ cups air-popped popcorn	45
12 grape tomatoes	25
½ cup baby carrots	35
1 medium box of raisins	45
1 rice cake	45
1 medium kiwi	45
24 thin pretzel sticks (½ oz.)	50
½ cup grapes	50
4 walnut halves or 6 almonds	50

Snacks 51–100 Calories

	Calories
8 dried apricot halves	67
½ cup apple slices	68
1 piece mozzarella string cheese	80
25 pistachios (unsalted)	100
6 oz. light, fat-free yogurt	100
½ cup celery sticks with 1 Tbsp peanut butter	100

Snacks 101–150 Calories

	Calories
½ cup sherbert	110
5 wheat crackers and 1 triangle of reduced fat spreadable cheese	120
25 dry roasted, unsalted peanuts	147

Quick Tips!

- Don't snack out of the bag. Remove only the amount you are going to eat.
- Try a new hobby like learning to play a musical instrument, gardening or yoga to keep your hands and mind busy.
- If you feel the urge to snack, drink a calorie-free beverage such as water, flavored water, coffee, or tea to help beat the craving.
- Eat slowly. Pause between bites to enjoy your meal or snack fully.

Homemade Sugar-Free Popsicles

- Make a 2 quart pitcher of sugar-free drink mix according to the packaging directions.
- Pour the mixed drink into popsicle molds, freeze until solid.
- Use 4 oz. paper cups and popsicle sticks as an alternative to molds.



www.scandpg.org | 800.249.2875

Written by SCAN registered dietitian nutritionists (RDNs) to provide nutrition guidance. The key to optimal meal planning is individualization. Contact a SCAN RDN for personalized nutrition plans. Access "Find a SCAN RDN" at www.scandpg.org or by phone at 800.249.2875.

Sources:

Smoking - tips on how to quit. U.S. National Library of Medicine, MedlinePlus, Available from <http://www.nlm.nih.gov/medlineplus/ency/article/001992.htm>, Accessed August 4, 2015.

Weight gain - unintentional. U.S. National Library of Medicine, MedlinePlus, Available from <http://www.nlm.nih.gov/medlineplus/ency/article/003084.htm>, Accessed July 24, 2015.

National Nutrient Database for Standard Reference. U.S. Department of Agriculture. Available from <http://ndb.nal.usda.gov/>. Accessed July 24, 2015.

© 2016 Sports, Cardiovascular, and Wellness Nutrition (SCAN)

Contributed by: Mark Hoesten, RD, LD (2012) | Updated by Kelly L Kester, MS, RD, LDN and Molly DePrenger, MS, RDN, LDN (2016)

APPENDIX R- 15 Ideas To Get Moving

15 ACTIVITIES TO GET MOVING

- Walk in place, around the office, or outside
- Perform a series of exercises such as squats, lunges, leg extensions, calf raises, and trunk twists
- Sun salutations or a series of simple yoga stretches
- Hula hoop
- Stand and complete circles with each hand, arm, foot, leg, and hips, alternating
- One-song dance party
- Jump rope or pretend
- Climb stairs or mimic using a step stool
- Play with a soccer ball or hacky sack
- Stretch like a cat or dog
- Practice balancing on each leg alternately, raising legs higher
- Knee or toe touches
- Wiggle or shake body, starting with the head and going down to the feet
- Stand for a clean up break: file papers, return dishes to the break room, discard trash, wipe desk or white board
- Make or take calls while standing or walking

Adapted from Todays Dietitian Magazine July 2017

APPENDIX S- Start Your Exercise Program

Starting an exercise program can sound like a daunting task, but just remember that your main goal is to boost your health by meeting the basic physical activity recommendations:

- 150 minutes of moderate-intensity physical activity per week or vigorous-intensity activity at least 75 minutes per week, and
- Strength training at least twice per week. **For healthy adults under age 65 with no apparent chronic disease or conditions.**

STEP 1 — Set aside time each day to exercise. Getting started can often be the most difficult part of any exercise routine. Scheduling exercise into your day and making it a priority will increase the chance of being successful. Teaming up with a physical activity buddy (your dog counts!), joining an exercise class, combining physical activity with a social event (such as dancing, a fund-raising walk, etc.) are simple ways to get started.

STEP 2 — Just Move! If you can't fit in a workout, take the stairs instead of the elevator, park farther away, stand whenever you can, bicycle to do errands, walk the dog. These small steps can add up to health benefits.

STEP 3 — Choose aerobic activities you enjoy. Walking is a great way to do moderate-intensity physical activity. Moderate-intensity physical activity means working hard enough to raise your heart rate and to cause you to breathe harder, yet still being able to carry on a conversation. Do other moderate- or vigorous-intensity exercise such as swimming, biking, or playing basketball with friends, to get your daily physical activity. If you need a variety of activities to stay motivated, combine a few that appeal to you. Physical activity can be accumulated through a variety of activities.

STEP 4 — Start with 10 to 15 minutes of aerobic exercise daily. Each week, add five minutes to your exercise routine **until you reach 30 minutes of moderate-intensity for a minimum of five days per week.** Alternately, you may do 25 minutes of vigorous-intensity exercise three days per week. The 30-minute recommendation is for the average healthy adult to maintain health and reduce the risk for chronic disease. To lose weight or maintain weight loss, 60 to 90 minutes per day of physical activity may be necessary.

STEP 5 — Add strength training into your routine. Do eight to 10 strength-training exercises, eight to 12 repetitions of each exercise twice a week. You can use dumbbells, resistance bands or your own body weight. If you are unsure how to do the exercises correctly, ask your dietitian for a referral to an exercise professional or other local exercise resources.

APPENDIX T- Letter To Primary Care Physician

Dear

I am writing to tell you about a research study being conducted at Victoria Goodman Nutrition. Victoria is studying how diet and lifestyle may mitigate menopausal symptoms and reduce a woman's dependence on pharmaceuticals.

The researcher is looking for adult women between the ages of 45- 62, and are experiencing menopausal symptoms. Participation would involve 6 visits over a 3-month period, each lasting 60 minutes. No medications will be involved. The participants will be counseled on dietary and lifestyle behaviors to decrease or eliminate menopausal symptoms. Participation will include dietary and medical evaluation, surveys and medical history. Assessments such as blood pressure, DEXA scan and blood tests will be obtained via the medical chart. Height and weight will be obtained in the office.

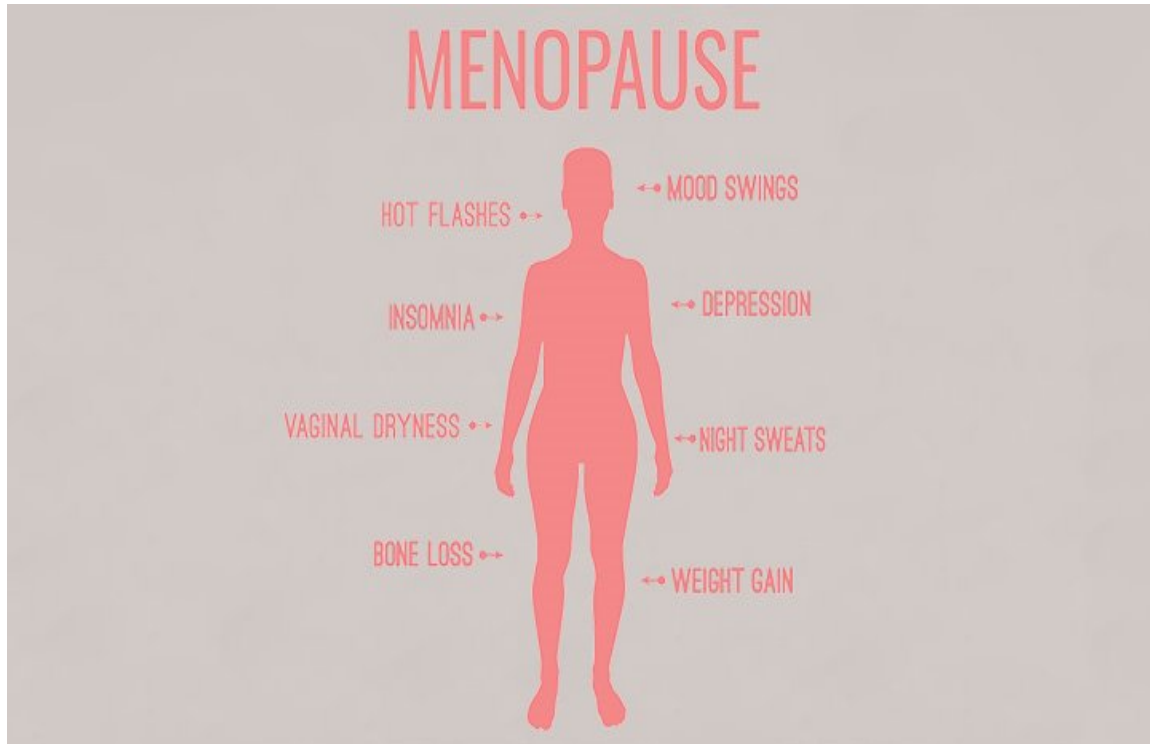
The researcher hopes that the results from this study will help to better understand menopause and what dietary and lifestyle strategies can be used to mitigate symptoms and improve quality of life, and benefit women in the future.

Please contact Victoria Goodman at 215-920-4656 if you would like to learn more about the study. Your participation is voluntary.

Thank you in advance for considering this request,

Victoria Goodman, MS, RD, LDN
610 Old York Rd Suite 70
Jenkintown, PA 19046

APPENDIX U- Flyer For Study



IF YOU ARE A WOMAN BETWEEN THE AGES OF 52-62 YEARS AND ARE EXPERIENCING MENOPAUSAL SYMPTOMS YOU MAY BE QUALIFIED TO PARTICIPATE IN A RESEARCH STUDY USING DIET AND LIFESTYLE TO REDUCE THESE SYMPTOMS.

PLEASE CONTACT VICTORIA GOODMAN, REGISTERED DIETITIAN FOR FURTHER INFORMATION AT 215-920-4656 OR VWGOODMAN@GMAIL.COM

Appendix V- Consent and Authorization forms

CLIENT INFORMATION AND CONSENT FORM

Today's Date: _____

Name: _____
(Last, First, Middle Initial)

Date of Birth: _____ Sex: Male / Female
(Month/Day/Year)

Address: _____

City: _____ State: _____ Zip Code: _____

Home Phone: (____) _____ Cell Phone: (____) _____ Work Phone: (____) _____

May I leave confidential messages for you at any of the above numbers? Yes / No (Specify): ☐ Home ☐ Work ☐ Cell

Email Address: _____ May I contact you by email? Yes / No

Primary Care Physician: _____ Physician's Phone: (____) _____

Physician's Address: _____ City: _____ State: _____ Zip Code: _____

CONFIDENTIALITY:

Nutrition consulting/education is a confidential process designed to help you address your health concerns, come to a greater understanding of yourself and the relationship that diet and lifestyle practices can have on one's health, and learn effective dietary, lifestyle, supplemental and stress management strategies. It involves a relationship between you and a student who has the desire and willingness to help you accomplish your individual goals.

All information gathered from the client, including name, contact information and medical history are secured and confidential within Victoria Goodman. Any views expressed by the client to Victoria Goodman will be held with the utmost confidentiality. Information will only be released with the consent of the client unless said information may potentially be injurious to a third party.

CONSENT:

I, the client, have read and understand the information about the holistic health services offered by Victoria Goodman. I have discussed with Victoria Goodman the nature of the services to be provided. I understand that Victoria Goodman is not a licensed physician and as such cannot diagnose, treat or prescribe medications. I understand that the information provided on the relationship between nutrition and health is NOT meant to replace competent medical care or treatment for any health problem or condition and that it is my responsibility to maintain a relationship for myself/ child with a medical doctor or licensed health care practitioner. The nature of the nutrition assessment and evaluation are to client wellness through food, herbs, nutritional supplements, education, exercise programs, and lifestyle changes. I certify that I am here solely on my own behalf. I am not representing any other person, company, association, and/or on the behalf of any governmental agency. I, the client, give consent to the nutrition assessment and evaluation offered by the student.

Signature _____ Date _____
(client/ parent/ guardian)

**CLIENT AUTHORIZATION FORM
FOR
RELEASE OF INFORMATION**

VICTORIA GOODMAN NUTRITION COUNSELING
RELEASE OF INFORMATION

I GIVE MY CONSENT FOR VICTORIA GOODMAN NUTRITION TO CONTACT THE
FOLLOWING HEALTHCARE PROVIDERS REGARDING:

Patient name_____ Date of birth_____

Address_____

Physicians

Primary Care Physician

Name_____ Phone_____

Address_____

Patient signature_____ Date_____

REFERENCES CITED

Agrinier, N., Cournot, M., Dallongeville, J., Arveiler, D., Ducimetiere, P., Ruidavets, J. B., & Ferrieres, J. (2010). Menopause and modifiable coronary heart disease risk factors: a population based study. *Maturitas*, 65(3), 237-243. doi:10.1016/j.maturitas.2009.11.023

American Heart Association. (2019). Retrieved from <http://www.americanheart.org/presenter.jhtml?identifier=1200010>

Barrett, K., Barman, S., Boitano, S., & Brooks, H. (2012). *Ganong's review of medical physiology*: McGraw-Hill.

Bener, A., Saleh, N. M., & Bhugra, D. (2016). Depressive symptoms and bone mineral density in menopause and postmenopausal women: A still increasing and neglected problem. *J Family Med Prim Care*, 5(1), 143-149. doi:10.4103/2249-4863.184640

Bennett, P., Bland, J., Darland, G., DeAnne, L., Galland, L., Hyman, M., . . . Jones, S. (2010). *Textbook of functional medicine*. Gig Harbor, WA: The Institute of Functional Medicine.

Bhavnani, B. (2002). Women's Health Initiative study. *J Obstet Gynaecol Can*, 24(9), 689-690.

Bulliyya, G. (2001). Risk of coronary heart disease in women after menopause. *J Indian Med Assoc*, 99(9), 478-480, 482.

Choi, B. O., Lee, Y. J., Choi, J. H., Cho, S. W., Im, H. J., & An, J. E. (2015). The Association between Stress Level in Daily Life and Age at Natural Menopause in Korean Women: Outcomes of the Korean National Health and Nutrition Examination Survey in 2010-2012. *Korean J Fam Med*, 36(6), 305-309. doi:10.4082/kjfm.2015.36.6.305

Cortisol-its role in stress, inflammation and indications for diet therapy. (2009). Retrieved from <http://www.todaysdietitian.com/newarchives/111609p38.shtml>

Danby, F. W. (2005). Management of menopause-related symptoms. *Ann Intern Med*, 143(11), 845-846; author reply 846.

Davis, S. R., Castelo-Branco, C., Chedraui, P., Lumsden, M. A., Nappi, R. E., Shah, D., . . . Writing Group of the International Menopause Society for World Menopause, D. (2012). Understanding weight gain at menopause. *Climacteric*, 15(5), 419-429. doi:10.3109/13697137.2012.707385

Deecher, D. C., & Dorries, K. (2007). Understanding the pathophysiology of vasomotor symptoms (hot flushes and night sweats) that occur in perimenopause, menopause, and postmenopause life stages. *Arch Womens Ment Health*, 10(6), 247-257. doi:10.1007/s00737-007-0209-5

Depression at menopause. (2007). *Harv Ment Health Lett*, 23(10), 6.

Diamanti-Kandarakis, E., Bourguignon, J. P., Giudice, L. C., Hauser, R., Prins, G. S., Soto, A. M., ... Gore, A. C. (2009). Endocrine-disrupting chemicals: an Endocrine Society scientific statement. *Endocr Rev*, 30(4), 293-342. doi:10.1210/er.2009-0002

Dibonaventura, M. D., Wagner, J. S., Alvir, J., & Whiteley, J. (2012). Depression, quality of life, work productivity, resource use, and costs among women experiencing menopause and hot flashes: a cross-sectional study. *Prim Care Companion CNS Disord*, 14(6). doi:10.4088/PCC.12m01410

Extance, A. (2015). Common chemicals linked to early menopause. *Chemistry World*.

Fertman, C., & Allensworth, D. (2017). *Health promotion programs* (second ed.). San Francisco, CA: Jossey- Bass.

Fogleman, C. D. (2012). Exercise for treatment of the vasomotor symptoms of menopause. *Am Fam Physician*, 85(3), 237.

Food and your bones- osteoporosis nutrition guidelines. (2017). Retrieved from <https://www.nof.org/patients/treatment/nutrition/>

Force, U. S. P. S. T. (2002). Postmenopausal hormone replacement therapy for primary prevention of chronic conditions: recommendations and rationale. *Ann Intern Med*, 137(10), 834-839.

Gersh, F. (2017). Subclinical hypothyroidism controversial treatment recommendations made clear. Retrieved from <https://integrativerd.org/wp-content/uploads/2012/04/DIFM-Fall-2017-E-Version-Proof4eitted.pdf>

Gold, E. B. (2011). The timing of the age at which natural menopause occurs. *Obstet Gynecol Clin North Am*, 38(3), 425-440. doi:10.1016/j.ogc.2011.05.002

Goluch-Koniuszy, Z. S. (2016). Nutrition of women with hair loss problem during the period of menopause. *Prz Menopauzalny*, 15(1), 56-61. doi:10.5114/pm.2016.58776

Gomez-Pinilla, F. (2008). Brain foods: the effects of nutrients on brain function. *Nat Rev Neurosci*, 9(7), 568-578. doi:10.1038/nrn2421

Grindler, N. M., & Santoro, N. F. (2015). Menopause and exercise. *Menopause*, 22(12), 1351-1358. doi:10.1097/GME.0000000000000536

Hagey, A. R., & Warren, M. P. (2008). Role of exercise and nutrition in menopause. *Clin Obstet Gynecol*, 51(3), 627-641. doi:10.1097/GRF.0b013e318180ba84

Health belief model. (n.d.). Retrieved from https://www.utwente.nl/cw/theorieenoverzicht/theory%20clusters/health%20communication/health_belief_model/

Heart disease facts and statistics. (2017). Retrieved from <http://www.cdc.gov/heart>

Holmes, T. H., & Rahe, R. H. (1967). The Social Readjustment Rating Scale. *J Psychosom Res*, 11(2), 213-218.

Hong, S. A., & Kim, M. K. (2017). Relationship between fruit and vegetable intake and the risk of metabolic syndrome and its disorders in Korean women according to menopausal status. *Asia Pac J Clin Nutr*, 26(3), 514-523.

Hormone Replacement Therapy for the Primary prevention of Chronic Conditions in Postmenopausal Women: An Evidence Review for the U.S. Preventative Services Task Force. (2017). Retrieved from https://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0098936/pdf/PubMedHealth_PMh0098936.pdf

Hormone therapy: is it right for you? (2015). Retrieved from <http://www.mayoclinic.org/diseases-conditions/menopause/in-depth/hormone-therapy/ART-20046372>

Hyman, M. (2009). *The ultramind solution*. New York, NY: Scribner.

Jorge, M. P., Santaella, D. F., Pontes, I. M., Shiramizu, V. K., Nascimento, E. B., Cabral, A., . . . Ribeiro, A. M. (2016). Hatha Yoga practice decreases menopause symptoms and improves quality of life: A randomized controlled trial. *Complement Ther Med*, 26, 128-135. doi:10.1016/j.ctim.2016.03.014

Jull, J., Stacey, D., Beach, S., Dumas, A., Strychar, I., Ufholz, L. A., . . . Prud'homme, D. (2014). Lifestyle interventions targeting body weight changes during the menopause transition: a systematic review. *J Obes*, 2014, 824310. doi:10.1155/2014/824310

Kahleova, H., Lloren, J. I., Mashchak, A., Hill, M., & Fraser, G. E. (2017). Meal Frequency and Timing Are Associated with Changes in Body Mass Index in Adventist Health Study 2. *J Nutr*, 147(9), 1722-1728. doi:10.3945/jn.116.244749

Kalra, B., Agarwal, S., & Magon, S. (2012). Holistic care of menopause: Understanding the framework. *J Midlife Health*, 3(2), 66-69. doi:10.4103/0976-7800.104453

Lee, F. (2013). Mediterranean diet aims to keep heart healthy. *USAtoday*. Retrieved from <http://www.usatoday.com/story/news/.../mediterranean-diet-health.../2013417/>

Lee, H. K., Kim, S. Y., & Sok, S. R. (2016). Effects of Multivitamin Supplements on Cognitive Function, Serum Homocysteine Level, and Depression of Korean Older Adults With Mild Cognitive Impairment in Care Facilities. *J Nurs Scholarsh*, 48(3), 223-231. doi:10.1111/jnu.12201

- Life expectancy at birth (in years) by gender. (2018). Retrieved 2018
<http://www.kff.org/other/state-indicator/life-expectancy-by-gender/>
- Logan, A. C. (2004). Omega-3 fatty acids and major depression: a primer for the mental health professional. *Lipids Health Dis*, 3, 25. doi:10.1186/1476-511X-3-25
- Lourida, I., Soni, M., Thompson-Coon, J., Purandare, N., Lang, I. A., Ukoumunne, O. C., & Llewellyn, D. J. (2013). Mediterranean diet, cognitive function, and dementia: a systematic review. *Epidemiology*, 24(4), 479-489. doi:10.1097/EDE.0b013e3182944410
- Low Dog, T. (2005). Menopause: a review of botanical dietary supplements. *Am J Med*, 118 Suppl 12B, 98-108. doi:10.1016/j.amjmed.2005.09.044
- Maltais, M. L., Desroches, J., & Dionne, I. J. (2009). Changes in muscle mass and strength after menopause. *J Musculoskelet Neuronal Interact*, 9(4), 186-197.
- Mastorakos, G., Valsamakis, G., Paltoglou, G., & Creatsas, G. (2010). Management of obesity in menopause: diet, exercise, pharmacotherapy and bariatric surgery. *Maturitas*, 65(3), 219-224. doi:10.1016/j.maturitas.2009.12.003
- Mediterranean diet and cognitive decline in women with cardiovascular disease or risk factors. (2012). Retrieved from [http://www.andjrn.org/article/S2212-2672\(12\)00290-0/fulltext](http://www.andjrn.org/article/S2212-2672(12)00290-0/fulltext)
- Mediterranean diet for heart health. (2019). Retrieved from <http://www.mayoclinic.com/health/mediterranean-diet/CL00011>
- Mediterranean diet pyramid. (2009). Retrieved from http://oldwayspt.org/system/files/atoms/files/OW_MediterraneanDietPyramid_0.pdf
- Mediterranean diet. (2012). Retrieved from <http://www.nlm.nih.gov/.../ency/patientinstructions/000110.htm>
- Menopause and heart disease. (2017). Retrieved from http://www.heart.org/HEARTORG/Conditions/More/MyHeartandStrokeNews/Menopause-and-Heart-Disease_UCM_448432_Article.jsp#
- Menopause: Symptoms, Treatment, Diagnosis. (n.d.). Retrieved from <http://obgyn.ucla.edu/menopause>
- Michaels, J., & van Aalst, M. (2009). *Master your metabolism: The 3 diet secrets to naturally balancing your hormones for a hot and healthy body*. New York, NY: Crown Publishing.
- Mishra, N., Mishra, V. N., & Devanshi. (2011). Exercise beyond menopause: Dos and Don'ts. *J Midlife Health*, 2(2), 51-56. doi:10.4103/0976-7800.92524

- Morin, K. (2017). 23 scientifically backed ways to reduce stress right now. Retrieved from https://www.huffpost.com/entry/reduce-stress-research_n_2884876
- Nagata, C., Wada, K., Nakamura, K., Tamai, Y., Tsuji, M., & Shimizu, H. (2012). Associations of physical activity and diet with the onset of menopause in Japanese women. *Menopause*, 19(1), 75-81. doi:10.1097/gme.0b013e3182243737
- Nedrow, A., Miller, J., Walker, M., Nygren, P., Huffman, L. H., & Nelson, H. D. (2006). Complementary and alternative therapies for the management of menopause-related symptoms: a systematic evidence review. *Arch Intern Med*, 166(14), 1453-1465. doi:10.1001/archinte.166.14.1453
- Northrup, C. (2012). *The wisdom of menopause: creating physical and emotional health during the change* (Vol. 2nd ed). New York, NY: Bantam.
- Park, H. J., Lee, S. E., Kim, H. B., Isaacson, R. E., Seo, K. W., & Song, K. H. (2015). Association of obesity with serum leptin, adiponectin, and serotonin and gut microflora in beagle dogs. *J Vet Intern Med*, 29(1), 43-50. doi:10.1111/jvim.12455
- Perlmutter, D. (2004). *The better brain book*. New York, NY: River Head Books.
- Prochaska H.J., N., J.C., & DiClemente, C.C. (1994). *Changing for good: a revolutionary six-stage program for overcoming bad habits and moving your life positively forward*. New York: Avon Books.
- Richardson, T. A., & Robinson, R. D. (2000). Menopause and depression: a review of psychologic function and sex steroid neurobiology during the menopause(1). *Prim Care Update Ob Gyns*, 7(6), 215-223.
- Rizzoli, R., Bischoff-Ferrari, H., Dawson-Hughes, B., & Weaver, C. (2014). Nutrition and bone health in women after the menopause. *Womens Health (Lond)*, 10(6), 599-608. doi:10.2217/whe.14.40
- Rosch, P. (n.d.). Effects of stress. Retrieved from <https://www.stress.org/the-effects-of-stress>
- Ross, S. M. (2015). The traditional Mediterranean diet: an ancient prescription for health and longevity. *Holist Nurs Pract*, 29(3), 174-177. doi:10.1097/HNP.000000000000089
- Santoro, N. (2016). Perimenopause: From Research to Practice. *J Womens Health (Larchmt)*, 25(4), 332-339. doi:10.1089/jwh.2015.5556
- Schachter, H. M., Kourad, K., Merali, Z., Lumb, A., Tran, K., & Miguelez, M. (2005). Effects of omega-3 fatty acids on mental health. *Evid Rep Technol Assess (Summ)*(116), 1-11.
- Schmidt, C. W. (2017). Age at Menopause: Do Chemical Exposures Play a Role? *Environ Health Perspect*, 125(6), 062001. doi:10.1289/EHP2093

Schneider, H. P., Heinemann, L. A., Rosemeier, H. P., Potthoff, P., & Behre, H. M. (2000). The Menopause Rating Scale (MRS): reliability of scores of menopausal complaints. *Climacteric*, 3(1), 59-64.

Schug, T. T., Janesick, A., Blumberg, B., & Heindel, J. J. (2011). Endocrine disrupting chemicals and disease susceptibility. *J Steroid Biochem Mol Biol*, 127(3-5), 204-215. doi:10.1016/j.jsbmb.2011.08.007

Shekhar, S., Travis, O. K., He, X., Roman, R. J., & Fan, F. (2017). Menopause and Ischemic Stroke: A Brief Review. *MOJ Toxicol*, 3(4). doi:10.15406/mojt.2017.03.00059

Simpson, P. D., & Morris, E. P. (2015). Is it possible to manage the symptoms of the menopause without estrogen? *Womens Health (Lond)*, 11(4), 429-431. doi:10.2217/whe.15.23

Soares, C. N. (2016). Menopause and depression: keep your eye on the long run. *Menopause*, 23(12), 1272-1274. doi:10.1097/GME.0000000000000791

Soy, black cohosh may have some benefit for menopause symptoms. (2006). *J Fam Pract*, 55(11), 939.

Studies show alternative therapies not very effective for menopause symptoms. (2007). *Mayo Clin Womens Healthsource*, 11(1), 3.

Sydora, B. C., Yuksel, N., Veltri, N. L., Marillier, J., Sydora, C. P., Yaskina, M., . . . Ross, S. (2017). Patient characteristics, menopause symptoms, and care provided at an interdisciplinary menopause clinic: retrospective chart review. *Menopause*. doi:10.1097/GME.0000000000000942

The American Institute of Stress. (n.d.). Retrieved from <http://www.stress.org>

The endocrine system. (2018). *Endocrine system/hormone health network*. Retrieved from <https://www.hormone.org/hormones-and-health/the-endocrine-system>

The hormones that cause menopause. (n.d.). Retrieved from <https://www.womens-health-advice.com/menopause-effects.html>

The transtheoretical model. (2017). Retrieved from <http://web.uri.edu/cprc/transtheoretical-model/>

Traditional med diet. (n.d.). Retrieved from <http://oldwayspt.org/resources/heritage-pyramids/mediterranean-diet-pyramid/traditional-med-diet>

Weinstein, N., Sandman, P., & Blalock, S. (2008). The precaution adoption process model.

What is Cortisol. (2018). *Hormone Health Network/ Your Endocrine System*. Retrieved from <https://www.hormone.org>

What is Progesterone. (2018). *Hormone Health Network/Your Endocrine System*. Retrieved from <https://www.hormone.org>

Women's Health Initiative (WHI). (2002). Retrieved from <https://www.whi.org>

World's healthiest foods rich in folate. (2019). Retrieved from <http://www.whfoods.com/genpage.php?tname=nutrient&dbid=63>

Young, S. N. (2007). How to increase serotonin in the human brain without drugs. *J Psychiatry Neurosci*, 32(6), 394-399.

Zang, H., He, L., Chen, Y., Ge, J., & Yao, Y. (2016). The association of depression status with menopause symptoms among rural midlife women in China. *Afr Health Sci*, 16(1), 97-104. doi:10.4314/ahs.v16i1.13

ADDENDUM

The program “10 Steps to Improve Menopausal Symptoms”, as indicated in the chart below will improve the life of women. The program addresses specific body systems through assessment, evaluation, education and support as described below.

10 Steps to Improve Menopausal Symptoms

Week	Phase	Targets	Appendix-Materials	Outcomes	Physiological Assessment
1 Introduction, Assess and advise	One: Evaluate and set goals	Assess and Advise	A. Menopausal Rating System B. Medical and Nutrition Survey C. Stages of Change Survey D. 24 hour Diet Recall E. Food frequency Survey M. Stress Evaluation Survey V. Consent Form and Authorization Forms	Understanding of the topic	<ul style="list-style-type: none"> • Height • Weight • BMI • T3 • T4 • TSH • DEXA scan • Cholesterol • HDL • LDL • TG • Blood pressure
3 Thyroid and bone health	Two: Remove noxious conditions	Thyroid and bone	O. Thyroid questionnaire Educational materials F and P.	Knowledge of hypothyroidism and bone demineralization	<ul style="list-style-type: none"> • Weight
5 Cardiovascular health	Two: Remove noxious conditions	Cardiovascular	Educational materials K., L., Q, R, S.	Knowledge of cardiovascular risks	<ul style="list-style-type: none"> • Weight
7 Brain and stress	Three: Rebalance and Heal	Brain and stress	Educational materials J. and N.	Knowledge of mood and depression	<ul style="list-style-type: none"> • Weight
9	Three:	Integumentary	Educational	Knowledge of	<ul style="list-style-type: none"> • Weight

Integumentary system and vasomotor events	Rebalance and Heal	and vasomotor	materials G, H, I.	hair and skin care and sleep	
11 Reassess	Rebalance and Heal	Reevaluate	A. Menopausal Rating System Survey C. Stages of Change Survey D. 24 Hour Recall E. Food Frequency Survey M. Stress Evaluation Survey	Importance of diet and lifestyle, mindset and support.	<ul style="list-style-type: none"> • Height • Weight • BMI • T3 • T4 • TSH • DEXA scan • Cholesterol • HDL • LDL • TG • Blood pressure

Each bi-monthly session will be for a duration of 60-90 minutes. Support during the week will consist of e-mails, telephone calls and additional face-to-face sessions if necessary for encouragement and support.

Week 1:

Body System:

The whole body is assessed in the first week of the program as well as the nutritional state of the client. This will determine particular areas that may need to be focused upon individually for the participants. Specifically, the body systems targeted in this program include the skeletal, endocrine, gastrointestinal, nervous, integumentary and cardiovascular. Stress, pain level, symptoms and state of desire to change are evaluated

Measurement description and reasoning for this system:

Height, Weight, BMI- determine base values

Nutrition- determine base values

Symptoms- determine base values

T3, T4, TSH- determine base values, described below during education of this body system

DEXA scan- base values, described below during education of this body system
Cholesterol, HDL, LDL, TG, Blood pressure- base values, described below
during education of this body system

First of all anthropometric measurements are taken such as height, weight and BMI is calculated and these are chosen for several reasons. One is that the clinician can determine if body weight is appropriate. It is important to determine if weight has a negative effect on health as risk of developing obesity and related diseases increase. This was chosen as the first parameter to measure because a most common complaint is weight gain, especially in the abdominal area at menopause. Women also report it is more challenging to keep off the weight. This is important because increased weight may contribute to other health concerns including metabolic syndrome, type 2 diabetes and cardiovascular disease and some cancers. Obesity may also contribute to decreased self-esteem, less mobility and physical activity. If BMI measurement 25- 29, one is classified as overweight. If BMI is 30 or greater, one is considered obese.

The skeletal integrity is also evaluated by way of height and DEXA scan results during the initial clinical assessment. This skeletal system functions to provide structural support and maintain calcium and phosphorus levels and store energy as lipids in bone marrow. Other systems that are evaluated include hormone release and ability. This is because of the decrease in estrogen and testosterone, as the decrease of these hormones act to decrease bone density and muscle mass, thus may influence the ability to be physically active. This will be measured by height and DEXA scan results. The loss of muscle mass due to changes in estrogen and progesterone may contribute to decreasing the rate in which the body utilizes calories.

Thyroid evaluation is determined because problems as part of the endocrine system may increase risk of menopausal symptoms such as weight, mood, vasomotor as well as osteoporosis risk. The levels of T3, T4 and TSH are valuable tools to examine thyroid function. When thyroid hormones are disrupted, a woman may experience a decrease in energy, weight gain, brain fog,

depression, changes in skin and hair and constipation, thus can be confused with menopausal symptoms.

Menopause itself does not cause cardiovascular disease, and the decrease in estrogen may play an important role because a function of estrogen is to help keep blood vessels flexible and accommodate blood flow. Other risks that may occur are increased blood pressure, decreased LDL and HDL, and an increase in TG. Not only are these measurements important to evaluate cardiovascular health, but increased TG also is a good indication of abnormal fatty tissue and glycemic stress.

Diet and the nutritional status of the participant is evaluated by several surveys. These include the Medical and Nutrition Survey, 24 Hour Recall and Food Frequency Survey. Participants will be counseled on a whole food diet and based on the information obtained from these surveys will receive a personalized consultation on improved diet and lifestyle.

Reasons for chosen order of “Targets” in this session:

The reason why this order of targets was chosen is because it is important to determine if weight has a negative effect on health and menopausal symptoms. This information is useful in assessing risk of obesity, diabetes and cardiovascular disease. Thyroid health is evaluated to examine if influencing weight, bone health, mood and vasomotor symptoms. Symptoms of thyroid disorders have similar symptoms to that of menopause; therefore this information may aid in distinguishing between the two. Bone health in itself may influence ability for physical activity. Blood lipids are evaluated to determine heart health as estrogen loss negatively influences HDL and TG. A low HDL may also indicate insulin resistance.

Assessment of Stages of Change and reason for determining this

Stages of Change- determine base values

The Stages of Change Survey will help participants learn how to take the next step in improving menopausal symptoms. It will gauge what stage the subject is in at the beginning of the program, and at the end. Individuals will be able to evaluate the benefits and negatives of behavior change throughout each stage, and continue throughout life.

Week 3:

Body System:

The endocrine and skeletal system will be targeted at this session.

Measurement description and reasoning for this system:

The Thyroid questionnaire will be evaluated to determine symptoms.

Height, Weight, BMI
Nutrition
Symptoms
T3, T4, TSH
DEXA scan

Reason for chosen order of “Targets” in this session:

Based upon the week 1 evaluation of the whole body and the level of symptoms and desire of the participant to change as a function of their stage in the transtheoretical model education and suggestions for change will be instituted in the program in the next ten weeks. First of all thyroid and bone health as part of the endocrine and skeletal systems will be targeted because of the impact these body systems have on menopausal symptoms. The digestive system evaluation, based upon the week 1 will be used to determine any food sensitivities, such as a lactose intolerance, which may influence calcium rich food intake. Digestive health will also be evaluated as decreased estrogen and progesterone may cause colon function to decrease, The decrease in estrogen may act to increase cortisol levels. An increase in cortisol may decrease gastrointestinal function in that it could take longer to break down food, which could increase

risk of constipation. Also, decreased progesterone may also encourage constipation. Medications that the participants are on for thyroid, blood pressure and depression might contribute to constipation problems; thus, suggestions for diet changes and exercise will be part of this week's education and suggestions. Recommendations to improve thyroid and bone health will focus on reducing toxic load and physical activity.

Week 5:

Body System:

The cardiovascular body system will be targeted in week 5.

Measurement description and reasoning for this system:

Height, Weight, BMI

Nutrition

Symptoms

Cholesterol, HDL, LDL, TG, Blood pressure

Assessment of Stages of Change and reason for determining this:

Stages of Change- to determine if participants are ready to make changes to improve their cardiovascular health.

Reason for chosen order of "Targets" in this session:

The cardiovascular system education and suggestions are targeted next because heart disease is the most common cause of death in women 65 and older. Menopausal women have an increased risk of stroke. Other risk factors in women that can contribute to cardiovascular health include metabolic syndrome, diabetes and depression. It is not menopause that causes cardiovascular disease, but the issues occurring during menopause such as the decrease in estrogen and progesterone, body fat distribution, poor diet and unhealthy lifestyles. For instance, decreased estrogen may decrease HDL and increase LDL levels. This session will include the assessment of cholesterol, HDL, LDL, TG and blood pressure. Suggestions to improve these parameters will be focusing on diet, exercise, stress reduction, and smoking cessation.

Week 7:

Body System:

The nervous system will be targeted in week 7.

Measurement description and reasoning for this system:

Weight will be obtained to help assess changes made.

Assessment of Stages of Change and reason for determining this:

Weight will be obtained to determine if changes were made.

Height, Weight, BMI
Nutrition
Symptoms
Stages of Change

Reason for chosen order of “Targets” in this session:

Brain and stress as part of the nervous system is next studied because the most common health problems women face is depression. Decreased estrogen, progesterone and testosterone, increased FSH and changes in estradiol may be reason why brain changes occur. Estrogen is vital to brain integrity. Decreased estrogen may negatively affect memory, heart rate, metabolism, mood, stress, body temperature and sexual function. Depression may negatively impact relationship, family, work and overall quality of life. Week 7 will focus on diet, reducing stress and sleep.

Week 9:

Body System:

The integumentary system is targeted in week 9.

Measurement description and reasoning for this system:

Weight will be obtained to determine if changes were made.

Assessment of Stages of Change and reason for determining this:

Height, Weight, BMI

Nutrition
Symptoms
Stages of Change

Reason for chosen order of “Targets” in this session:

The integumentary system is assessed next to determine vasomotor symptoms, sleep disturbances, mood, skin and hair changes. Decreased estrogen negatively impacts cell rejuvenation of the epidermis, skin elasticity and collagen production, which may lead to dry and ageing looking skin. Decreased progesterone causes an unfavorable impact on androgens on hair., causes dryness and possible hair breakage and loss. Recommendations to improve these issues will be focusing on diet and sleep.

Week 11:

Body System:

The whole body is reassessed and evaluated. Values will be statistically analyzed. Skeletal, endocrine and cardiovascular systems will be reassessed and this will indicate if appropriate diet and lifestyle changes have prevented or reduced menopausal symptoms.

Measurement description and reasoning for this system:

Height, Weight, BMI- determine final values
Nutrition- determine final values
Symptoms- determine final values
T3, T4, TSH- determine final values
DEXA scan- determine final values
Cholesterol, HDL, LDL, TG, Blood pressure- determine final values

Assessment of Stages of Change and reason for determining this:

Stages of Change- determine final values

Reason for chosen order of “Targets” in this session:

Through the above program the participants will make lifelong changes to their diet and lifestyle focusing on thyroid and brain health, cardiovascular, brain and stress, and the integumentary system. This holistic diet and lifestyle protocol will improve their own health, their families and society in general. The program will assist women to improve their quality of life as well as reduce the possible harmful effects and financial obligation of pharmaceuticals.