



# MENOPAUSE WELLNESS

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SCW Fitness Education 151 Pfungsten Rd  
Unit P  
Deerfield, IL 60015  
847-562-4020  
[www.scwfit.com](http://www.scwfit.com)

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# COURSE INTRODUCTION

Menopause and perimenopause are natural phases in a woman's life that mark the cessation of reproductive capability at the time of midlife. These transitional periods, typically occurring between the ages of 40 and 55, bring about profound physical, emotional, and hormonal changes. In addition, women experience vasomotor, and psychological problems that reduce their quality of life. While this transition is inevitable, as the ovaries are the only organ guaranteed to fail in life, it does not have to be synonymous with endless suffering. In fact, it presents an opportunity for women to make informed and proactive health decisions that can positively influence overall well-being. Many women are searching for different, alternative methods to reduce the diagnostics of menopause and perimenopause. Physical activity is one of the recommended methods to reduce the severity of these symptoms. Not only does physical activity reduce the severity of symptoms but it also decreases the risk of bone loss due to lowered estrogen levels while increasing muscle mass, thereby decreasing the risk of sarcopenia. Sarcopenia and osteoporosis are two popular, but unwanted conditions, in the aging female body.

Menopause, defined as the absence of menstruation for 12 consecutive months, signals the end of a woman's reproductive years. The average age of menopause in the US is 52, 51 in Europe and 48 in Latin America. The age of the last period is affected by physical activity, hormonal contraception, smoking, alcohol intake and level of education. Perimenopause, on the other hand, is the transitional phase leading up to menopause. During perimenopause, hormone levels, particularly estrogen and progesterone, fluctuate irregularly, leading to a wide range of symptoms. Current research shows that perimenopausal women experience more severe symptoms than menopausal and post-menopausal women.

These hormonal fluctuations can result in characteristics such as hot flashes, night sweats, mood swings, sleep disturbances, and changes in menstrual patterns. While these experiences can be challenging, it's important to recognize that they are a natural part of the process and can vary widely in severity, frequency and duration among individuals. The duration and severity of perimenopausal symptoms can be influenced by genetics, lifestyle factors, and overall health.

Navigating menopause and perimenopause requires not just resilience but also informed decision-making. It is an opportunity for women to take control of their health and make choices that promote a smoother transition. Informed decisions encompass various aspects of health, including nutrition, physical activity, mental health, stress, sleep, pharmacological and medical interventions.

A balanced diet rich in essential nutrients becomes even more critical during menopause and perimenopause. Adequate calcium and vitamin D intake are essential to maintain bone health and

prevent osteoporosis, which becomes a heightened concern as estrogen levels decline. Additionally, a diet filled with antioxidants, fiber, and healthy fats can help manage weight, reduce inflammation, and alleviate some menopausal symptoms. The reduction of inflammation helps prevent the number one killer in the United States, heart disease. During perimenopause when estrogen levels are dropping, the risk of heart disease increases as higher estrogen levels prevent inflammation.

Regular physical activity is a cornerstone of overall health during menopause and perimenopause. In 2018, the Scientific Advisory Committee of the Royal College of Obstetrics and Gynecology published information that lifestyle changes such as regular endurance exercise may help to reduce vasomotor symptoms such as hot flashes, night sweats, and insomnia. Exercise can help manage weight, improve mood, reduce the risk of chronic diseases, and enhance cardiovascular health. Weight-bearing exercises are especially crucial for maintaining bone density and preventing fractures. Yoga seems to improve all perimenopausal and menopausal symptoms.

Menopause and perimenopause can bring about emotional challenges, including mood swings, anxiety, and depression. The risk of depression triples following menopause, so it is essential to prioritize mental health during this time. Strategies such as mindfulness, stress reduction techniques, therapy, and social support can make a substantial difference in emotional well-being.

For some women, medical interventions, including hormone therapy, may be considered to manage severe symptoms. Hormone therapy can effectively alleviate symptoms like hot flashes and vaginal dryness but should be discussed with a licensed healthcare provider, considering individual risk factors and preferences.

Menopause and perimenopause are profound life transitions, and each woman's experience is unique. By embracing informed decision-making and taking proactive steps to prioritize health, women can make these phases more manageable and even empowering. This workshop explores various aspects of menopause and perimenopause, offering insights into making healthy choices that contribute to a more comfortable and fulfilling life during this significant life transition.



# CHAPTER 1

## Perimenopause: Navigating the Transition

Perimenopause, often referred to as the menopausal transition, is a complex and multifaceted phase in a woman's life that precedes the onset of menopause. It is characterized by hormonal fluctuations and a variety of physical and psychological symptoms. This chapter provides an overview of the symptoms of perimenopause, drawing from peer-reviewed research, to shed light on this transformative stage.

### ***Hormonal Fluctuations***

Perimenopause is primarily driven by changes in sex hormone levels, particularly estrogen and progesterone. Estrogen is a term given to a group of three hormones (estradiol, estrone and estrial) but for simplification, we will refer to all three simply as estrogen. A steroid hormone produced primarily in the ovaries, but also in the adrenal glands and fat cells, estrogen plays a pivotal role in regulating the female reproductive system and maintaining various aspects of women's health. A steroid hormone is a category of hormone derived from cholesterol that easily crosses the cells' membranes. During perimenopause, estrogen levels fluctuate significantly, leading to a host of physical and psychological changes. These fluctuations are responsible for many of the hallmark symptoms of perimenopause, such as irregular menstrual cycles, hot flashes, mood swings, and vaginal dryness. Understanding the role of estrogen is crucial in comprehending the underlying mechanisms of perimenopausal symptoms and developing effective strategies for managing them. These fluctuations can lead to irregular menstrual cycles, one of the hallmark signs of this transitional phase. The perimenopause phase and its related symptoms can persist for approximately 8 years.

<b><i>THE ROLE OF ESTROGEN</i></b>
Regulate the growth and development of the human reproductive system
Protects the brain by maintaining proper blood flow
Assists with memory and motor control
The major protector against inflammation in the blood vessels
Regulates bone turn over in the adult skeleton
Controls serotonin and mood management
Prepares the body for pregnancy through the menstrual cycle

It is important to remember that estrogen in the fertile years is important for proper human reproduction, but as aging occurs, estrogen levels should naturally drop. Chronically high estrogen levels are considered carcinogenic and have been found repeatedly to increase the risk of feminine cancers, called estrogen-dependent cancers. Just recently (May 17, 2023) Harvard researchers published in Nature, a very well-respected medical journal:

“We have identified what we believe is the original molecular trigger that initiates a cascade

culminating in breast tumor development in a subset of breast cancers that are driven by estrogen,” said study senior investigator Peter Park, professor of Biomedical Informatics in the Blavatnik Institute at HMS.

The study also shows that the sex hormone estrogen is the culprit behind this molecular dysfunction because it directly alters a cell’s DNA.

Most, though not all, breast cancers are fueled by hormonal fluctuations. The prevailing view of estrogen’s role in breast cancer is that it acts as a catalyst for cancer growth because it stimulates the division and proliferation of breast tissue, a process that carries the risk for cancer-causing mutations. Adult weight gain, following menopause, may be the most significant risk factor for cancer, as more fat tissue causes more estrogen to circulate throughout the body. Fat also stores toxins, and when estrogen binds with a receptor on the surface of the fat cells, there is a promotion of growth and division of the toxic cells.

Progesterone is another crucial hormone in the context of perimenopause. It works in tandem with estrogen to regulate the menstrual cycle and maintain the uterine lining in preparation for potential pregnancy. As we grow older, progesterone decreases and cycles get shorter. During perimenopause, progesterone levels also experience fluctuations, contributing to the irregularity in menstrual cycles. This hormone plays a role in some perimenopausal symptoms, although its impact is often overshadowed by changes in estrogen levels. In some cases, a relative deficiency of progesterone relative to estrogen can occur, potentially leading to symptoms like heavy menstrual bleeding and mood swings. While estrogen tends to be the primary focus in discussions of perimenopause, understanding the role of progesterone is essential for a comprehensive grasp of the hormonal dynamics during this transitional phase and for managing related symptoms effectively.

<b>THE ROLE OF PROGESTERONE</b>
Prepare the endometrium for the implantation of a fertilized egg
Aids in breast development
Is a precursor to testosterone

During this transition time before menopause, the supply of mature eggs in a woman's ovaries diminishes and ovulation, becomes irregular. At the same time, the productions of estrogen and progesterone decrease, due to the diminishing eggs and the unlikelihood of pregnancy. It is the big drop in estrogen levels that causes most of the symptoms of menopause. Estrogen is known to drop, on average, to 50% of the original level and progesterone may drop to zero as perimenopause continues and menopause symptoms occur.

Research indicates that irregular menstrual cycles are common during perimenopause, with cycles becoming shorter or longer, and bleeding becoming lighter or heavier. These changes can be disruptive and may contribute to concerns about fertility and overall health. A woman technically is said to be in perimenopause until she goes for one total calendar year of 365 days without any menstrual bleeding.

## ***Hot Flashes and Night Sweats***

One of the most recognizable perimenopausal symptoms is hot flashes, experienced by up to 75% of women during this phase. These sudden, intense feelings of warmth, often accompanied by sweating, can occur day or night and significantly impact quality of life. Studies have shown that hot

flashes are linked to hormonal fluctuations, particularly declining estrogen levels. While estrogen drops 50% from initial levels during perimenopause, progesterone can drop to a level of zero. Hot flashes are one of the most common and often disruptive symptoms experienced by women during perimenopause. These sudden, intense waves of heat, often accompanied by sweating and a rapid heartbeat, can occur at any time, day or night, and significantly impact a woman's quality of life. While the exact cause is not fully understood, hot flashes are closely associated with hormonal fluctuations, particularly the decline in estrogen levels. This hormonal shift is believed to affect the body's thermoregulatory system, leading to the perception of heat. The thermoregulation of the body occurs in the hypothalamus of the brain. The brain receives a message that the body is overheating and sweating begins to cool the body. Hot flashes can vary in frequency and intensity among women, and their duration can extend for several years. Managing hot flashes during perimenopause often involves lifestyle modifications, such as wearing lightweight clothing and using fans, as well as considering medical interventions like hormone therapy when symptoms are severe and negatively impact daily life. Research shows that regular endurance exercise, reducing intakes of caffeine and alcohol may help to reduce hot flashes and night sweats. Understanding and addressing hot flashes is crucial for enhancing the well-being of women going through the perimenopausal transition.

## ***Sleep Disturbances***

Sleep disturbances, including insomnia and disrupted sleep patterns, are frequently reported during perimenopause. Research has demonstrated a connection between hormonal changes and sleep disturbances, with fluctuating estrogen levels affecting sleep-regulating mechanisms in the brain, specifically the hypothalamus. These hormonal shifts can have a direct impact on sleep patterns and contribute to the sleep disturbances commonly experienced by women during this transition.

- 1. Hot Flashes and Night Sweats:** Hot flashes, one of the hallmark symptoms of perimenopause, can be particularly disruptive to sleep. These sudden surges of heat can occur at any time, including during the night, leading to night sweats. As the body temperature rises during a hot flash, it can trigger a waking response, leading to frequent awakenings and difficulty falling back asleep.
- 2. Hormonal Changes:** Estrogen, which plays a crucial role in regulating sleep, experiences significant fluctuations during perimenopause. This hormone helps maintain the structure and function of the sleep-regulating centers in the brain, specifically the hypothalamus. The decline in estrogen levels can disrupt the body's ability to achieve and maintain restorative sleep, leading to increased wakefulness during the night.
- 3. Mood Disturbances:** Perimenopause can bring about mood swings, anxiety, and even symptoms of depression. These emotional changes can lead to heightened stress and worry, which can negatively impact sleep quality. Persistent racing thoughts and worries can make it difficult to relax and fall asleep. The stress hormone, cortisol, should be dropping as we move into the nighttime hours which aids in falling asleep. When menopause concerns raise chronic stress levels, the risk of insomnia increases.
- 4. Physical Symptoms:** Other physical symptoms of perimenopause, such as joint pain, headaches, and urinary issues, can also disrupt sleep. Pain or discomfort can make it challenging to find a comfortable sleep position and maintain restful slumber. Waking multiple times a night to use the restroom also contributes to poor sleep.
- 5. Changes in Sleep Architecture:** Research suggests that perimenopause can lead to alterations in sleep architecture, including changes in the distribution of sleep stages and a decrease in slow-wave sleep (deep sleep). These changes can result in less restorative sleep and increased sleep fragmentation. Less restorative sleep can lead to mood swings during the day.



**6. Environmental Factors:** Lifestyle factors, such as increased stress, poor diet, lack of exercise, and the use of electronic devices before bedtime, can exacerbate sleep disturbances during perimenopause.

Addressing sleep disturbances during perimenopause is crucial for maintaining overall health and well-being. Lifestyle modifications, including maintaining a consistent sleep schedule, creating a relaxing bedtime routine, and managing stress, can help improve sleep quality. Journaling, meditation, and/or block breathing has been shown to decrease stress levels and decrease the amount of time taken to fall into deep sleep. Melatonin, the sleep hormone can be increased through some simple nighttime rituals such as; decreasing the room temperature, sleeping in loose clothing, avoiding any blue-green light an hour prior to bed, blacking out all light sources and ingesting a light snack high in tryptophan, an essential amino acid know to increase melatonin levels. All animal proteins contain tryptophan but it is extremely high in game bird such as turkey, pheasant and dove.

The sleep pattern consists of four stages of non-REM sleep and one stage of REM (rapid eye movement) sleep. Stages one and two of nonREM sleep are considered light sleep and very few hormonal or physiological changes occur during these stages. The body returns to equilibrium and homeostasis during nonREM stages 3 and 4, considered deep sleep, and REM, the most restorative of all stages. The growth hormones are produced in stages 3 and 4 of nonREM and testosterone is produced in REM. These hormones play a major role in building tissue which is so important after menopause as aging brings on sarcopenia, an age related loss of type II muscle fibers.

As the night progresses, we continually cycle through the stages with each deep sleep stage getting a bit longer each cycle. As the REM stages get longer, the brain starts to lay down memories, weed through cognitive material deciding which to keep and which to let go. This is also the stage in which we solve problems and dream. The body goes into partial paralysis in an effort to keep us safe from acting out the dreams.

Unfortunately, the vasomotor symptoms involved with perimenopause and menopause disrupt our sleep patterns, so we don't always reap the benefits of deep sleep. Therefore, in these transitional times it is important to reduce or eliminate the intake of alcohol as alcohol disrupts our Circadian rhythms. Ethanol, or ethyl alcohol, which is safe to drink, is a depressant. However, once the liver metabolizes what is in the blood stream (at a rate of approximately 1 ounce of alcohol per hour), the byproducts (acetyldehyde and acetate) of alcohol metabolism disrupt the sleep centers in the brain. This disrupts the cycling through the sleep stages which prevents the body from returning to homeostasis after a physically or mentally stressful day.

In some cases, healthcare providers may recommend cognitive-behavioral therapy for insomnia (CBT-I) or, if symptoms are severe, discuss the potential benefits and risks of hormone therapy or other medical interventions to alleviate sleep-related issues. Understanding the complex interplay between hormonal changes and sleep disruptions during perimenopause is essential for women to effectively manage and improve their sleep patterns during this transitional phase.

## ***Mood Changes***

Perimenopause can bring about mood swings, irritability, and even symptoms of depression and anxiety. Research suggests that hormonal fluctuations, particularly the decrease in estrogen, can influence neurotransmitters in the brain, leading to emotional instability. These neurotransmitters include serotonin, GABA, oxytocin, and dopamine. Additionally, the psychological challenges of this life stage, such as adjusting to changing roles and expectations, can contribute to mood

disturbances. Becoming an empty nester or a caretaker for aging parents can increase stress, change dispositions and possibly lead to depression. Mood changes are a prominent and often challenging aspect of perimenopause, the transitional phase leading up to menopause. These emotional fluctuations can have a significant impact on a woman's overall well-being and quality of life. Several factors contribute to mood changes during perimenopause:

- 1. Hormonal Fluctuations:** Hormones play a pivotal role in regulating mood, and during perimenopause, there is a notable decline in estrogen and progesterone levels. Estrogen, in particular, has neuroprotective and mood-stabilizing effects. The hormonal imbalances that occur during perimenopause can disrupt the delicate balance of neurotransmitters in the brain, such as serotonin and dopamine, leading to mood swings, irritability, and even depressive symptoms. Serotonin is the “pleasure” neurotransmitter while dopamine is the “motivator” neurotransmitter.
- 2. Vasomotor Symptoms:** Hot flashes and night sweats, common perimenopausal symptoms, can be physically uncomfortable and emotionally distressing. Frequent and unpredictable hot flashes can lead to anxiety, frustration, and irritability, which can, in turn, affect mood.
- 3. Sleep Disturbances:** Sleep problems are often intertwined with mood changes during perimenopause. Insomnia, disrupted sleep patterns, and frequent awakenings can result in sleep deprivation, which can exacerbate mood swings and increase susceptibility to mood disorders.
- 4. Physical Symptoms:** Physical discomforts associated with perimenopause, such as headaches, joint pain, and vaginal dryness, can contribute to irritability and frustration, further impacting mood and overall well-being.
- 5. Life Transitions:** Perimenopause coincides with various life changes, including aging, potential empty nesting, and shifts in roles and responsibilities. These transitions can lead to emotional challenges as women adjust to new life stages and redefine their identities.
- 6. Psychological Factors:** Pre-existing psychological factors, such as a history of depression or anxiety, can influence how a woman experiences perimenopausal mood changes. Women with a predisposition to mood disorders may be more vulnerable to exacerbated symptoms during this phase.
- 7. Stress:** Chronic stress, whether related to personal, professional, or familial factors, can amplify mood swings and emotional distress during perimenopause.

It's essential to recognize that mood changes during perimenopause are highly individual and can vary in intensity and duration from woman to woman. While some may experience mild mood swings that are manageable, others may face more severe mood disturbances that require intervention. Managing perimenopausal mood changes often involves a multifaceted approach:

- **Lifestyle Modifications:** Adopting a healthy lifestyle that includes regular exercise, a balanced diet, stress reduction techniques, and adequate sleep can help stabilize mood.
- **Counseling and Therapy:** Psychotherapy, such as cognitive-behavioral therapy (CBT), can provide strategies for managing mood changes and improving emotional well-being.
- **Medication:** In cases of severe mood disturbances or clinical depression, healthcare providers may recommend medication to alleviate symptoms.
- **Social Support:** Maintaining a strong support network of friends and family can offer emotional support and a sense of belonging during this challenging phase.

Perimenopausal mood changes are a natural part of the aging process for many women. By understanding the contributing factors and seeking appropriate support and interventions, women can navigate this transitional phase with greater emotional resilience and improved mental health. Research has also shown that declining estrogen levels can lead to changes in vaginal health,

including dryness, itching, and pain during sexual intercourse. These symptoms can have a profound impact on a woman's sexual well-being and overall quality of life.

## ***Vaginal Changes and Sexual Discomfort***

Vaginal dryness is a common and often bothersome symptom experienced by many women during perimenopause. Several physiological changes contribute to this symptom:

**Hormonal Fluctuations:** The primary cause of vaginal dryness during perimenopause is the decline in estrogen levels. Estrogen plays a crucial role in maintaining the health and function of the vaginal tissues. It helps stimulate the production of mucus and maintains the thickness and elasticity of the vaginal lining. As estrogen levels decrease during perimenopause, the vaginal tissues become thinner, less elastic, and produce less moisture. This results in painful intercourse which decreases the libido even more so.

**Changes in Blood Flow:** Estrogen also influences blood flow to the genital area. Reduced estrogen levels can lead to diminished blood flow to the vagina, resulting in decreased lubrication and moisture. This can contribute to discomfort and pain during sexual activity.

**Altered pH Levels:** Estrogen helps maintain the acidic pH level in the vagina, which is essential for preventing the growth of harmful bacteria and maintaining a healthy balance of vaginal microorganisms. As estrogen declines, the vaginal pH may become less acidic, potentially increasing the risk of vaginal infections and discomfort.

**Psychological Factors:** The physical changes associated with vaginal dryness can also have psychological implications. Women may experience decreased sexual desire, self-esteem issues, and anxiety related to sexual activity due to discomfort and pain.

**Medications and Other Factors:** Certain medications, such as antihistamines and some antidepressants, can contribute to vaginal dryness. Additionally, smoking and excessive alcohol consumption can exacerbate vaginal dryness by impacting blood flow and overall vaginal health.

**Stress and Emotional Factors:** Chronic stress and emotional factors can influence sexual function and vaginal health. Stress can lead to muscle tension and reduced sexual arousal, exacerbating vaginal dryness and discomfort.

Addressing vaginal dryness during perimenopause is essential for maintaining sexual health and overall well-being. Several approaches can help alleviate this symptom:

- **Vaginal Moisturizers and Lubricants:** Over-the-counter vaginal moisturizers and lubricants can provide temporary relief by adding moisture and reducing friction during sexual activity.
- **Prescription Medications:** For women with more severe symptoms, healthcare providers may prescribe vaginal estrogen therapies, such as creams, tablets, or rings. These treatments can help restore vaginal health by replenishing estrogen locally in the vaginal tissues.
- **Lifestyle Modifications:** Maintaining a healthy lifestyle, including staying hydrated, quitting smoking, and managing stress, can support vaginal health.
- **Kegel Exercises:** Pelvic floor exercises, known as Kegel exercises, can help improve vaginal muscle tone and may alleviate some symptoms of vaginal dryness.
- **Open Communication:** Open and honest communication with a healthcare provider and a partner is crucial. Discussing concerns and seeking professional advice can lead to better management and understanding of the condition.

Vaginal dryness is a common and treatable symptom of perimenopause. With the right interventions and support, women can effectively manage this symptom and maintain their sexual health and overall quality of life during this life stage.

## Cognitive Changes

Cognitive changes during perimenopause are a complex and evolving area of research. While not all women experience significant cognitive changes during this transitional phase, some do report alterations in cognitive function, including memory lapses, difficulties with concentration and attention, and changes in overall cognitive performance. As women progress through perimenopause, it is not uncommon to walk into a room and not remember why. Losing things and stumbling over a loved one's name is the norm and not a sign of approaching dementia. Several factors contribute to cognitive changes during perimenopause:

- 1. Hormonal Fluctuations:** Hormonal fluctuations, particularly the decline in estrogen levels, are thought to play a role in cognitive changes during perimenopause. Estrogen receptors are widely distributed in the brain, including areas involved in memory and cognitive function. Estrogen has neuroprotective properties and influences neurotransmitter systems, such as acetylcholine and serotonin, which are critical for cognitive processes. As estrogen levels fluctuate, these changes can affect neural connectivity and function.
- 2. Sleep Disturbances:** Sleep problems are common during perimenopause and can have a direct impact on cognitive function. Sleep is crucial for memory consolidation and overall cognitive performance. Frequent awakenings, insomnia, and disrupted sleep patterns can lead to cognitive deficits, including impaired attention and memory.
- 3. Psychological Factors:** Emotional symptoms such as mood swings, anxiety, and depression are common during perimenopause. These psychological factors can influence cognitive function, as emotional distress can affect attention, concentration, and memory.
- 4. Stress:** Perimenopause can coincide with various life stressors, including career changes, aging parents, and adjustments to changing roles and expectations. Chronic stress can have a detrimental impact on cognitive function, contributing to memory lapses and difficulties with cognitive tasks.
- 5. Menstrual Irregularities:** Irregular menstrual cycles during perimenopause can disrupt hormone patterns, potentially influencing cognitive function. These irregularities can vary widely among women and may impact cognitive performance differently.
- 6. Lifestyle Factors:** Diet, exercise, and overall lifestyle choices can influence cognitive function. A healthy diet rich in antioxidants and omega-3 fatty acids, regular physical activity, and stress management techniques can support cognitive health during perimenopause.
- 7. Individual Variability:** It's essential to recognize that cognitive changes during perimenopause are highly variable among women. Some women may experience subtle cognitive alterations, while others may not notice any significant changes at all.

It's important to emphasize that cognitive changes during perimenopause are typically mild and temporary for most women. They do not necessarily indicate the development of cognitive disorders like Alzheimer's disease. Furthermore, many women continue to perform well in cognitive tasks and maintain their intellectual abilities throughout perimenopause.

To support cognitive health during perimenopause:

- Maintain a healthy lifestyle that includes regular exercise, a balanced diet, and stress management.
- Prioritize sleep and address sleep disturbances.
- Seek emotional support and counseling if psychological symptoms are impacting cognitive function.

- Stay mentally active with activities such as reading, puzzles, and social engagement. The research surrounding neuroplasticity during movement and activity is also positive for brain changes that begin during menopause.
- Consider hormone therapy or other medical interventions if cognitive changes are significant and distressing.

Understanding the multifaceted nature of cognitive changes during perimenopause is essential for women to navigate this phase with confidence and maintain cognitive well-being.

While cognitive changes during perimenopause are still an area of ongoing research, some studies suggest a potential link between hormonal fluctuations and cognitive function. Memory lapses and difficulties with concentration and attention have been reported by some women during this phase.

## ***Conclusion***

Perimenopause is a complex and transformative period in a woman's life marked by hormonal fluctuations that give rise to a diverse range of physical and psychological symptoms. Research provides valuable insights into the causes and manifestations of these symptoms. Understanding the spectrum of perimenopausal symptoms is essential for healthcare providers and women themselves, as it facilitates informed decisions about symptom management and care during this life transition. Further research in this field is necessary to enhance our comprehension of perimenopause and improve the quality of life for women experiencing this natural phase.



# CHAPTER 2

## Understanding Menopause

Menopause is puberty in reverse. It is basically a transition of one biological phase of ovarian function to another. Technically, menopause is defined as the cessation of menstruation for 12 consecutive months, marking the end of a woman's reproductive years. During the menopause transition (otherwise known as perimenopause) there are many unpredictable occurrences, times when a woman may think she is menopausal but it is a false alarm, only to have her period return. Most women will spend one third, or possibly one half of life in menopause. If you include perimenopause, it is definitely one half of the lifetime!

There are many determinants for the timing of perimenopause and menopause. Genetics is the major determinant, some studies showing genetics control 30%-85% of the timing of menopause. The higher percentage seems to be in familial relationships where the age is extreme, either abnormally early or exceptionally later in life. Secondary to genetics, smoking has been shown to be the second biggest determinant, lowering the age by two years. This is because of the irreversible damage done to the ovaries from the toxins in the blood stream of smokers. Women in poorer health also seem to have earlier ages of perimenopause while women with greater child births have a later onset. There are conflicting results when looking at research regarding a woman's weight and the onset of perimenopause.

Regardless of the time of onset, perimenopause and menopause are two distinct but interconnected phases in a woman's reproductive life, each marked by its own unique characteristics. We focused on perimenopause in the first chapter and now we move to menopause after reviewing perimenopause:

### Perimenopause:

- 1. Definition:** Perimenopause is the transitional phase that precedes menopause. It typically begins in a woman's 40s but can start earlier or later, and it can last anywhere from a few months to several years. The average length of symptoms from perimenopause through menopause is 8 years. The term "perimenopause" literally means "around menopause" or "near menopause."
- 2. Hormonal Changes:** During perimenopause, a woman's hormonal levels, particularly estrogen and progesterone, begin to fluctuate irregularly. Estrogen levels gradually decline, leading to various symptoms and changes in the menstrual cycle. The reproductive hormones change when the number of follicles in the ovaries is rapidly decreasing, thereby making pregnancy improbable but not impossible.
- 3. Menstrual Changes:** Irregular menstrual cycles are a hallmark of perimenopause. Periods may become shorter, longer, lighter, or heavier, and the time between periods may vary. Some women may experience skipped periods.
- 4. Symptoms:** Perimenopause is associated with a range of symptoms, including hot flashes, night sweats, mood swings, sleep disturbances, vaginal dryness, libido and cognitive changes. These symptoms can vary in intensity and duration.
- 5. Fertility:** While fertility decreases during perimenopause due to irregular ovulation and hormonal

changes, it is still possible to become pregnant. Contraception may be necessary for women who do not wish to conceive.

## Menopause:

1. **Definition:** Menopause marks the end of a woman's reproductive years. It is defined as the cessation of menstruation for 12 consecutive months. Menopause typically occurs around the age of 50, but the exact timing can vary widely among women.
2. **Hormonal Changes:** In menopause, hormonal fluctuations stabilize, and estrogen and progesterone levels remain consistently low. This hormonal shift continues for the rest of a woman's life.
3. **Menstrual Changes:** Menstruation stops completely during menopause, and women no longer experience monthly periods.
4. **Symptoms:** While some symptoms like hot flashes and mood changes may continue into menopause, they often become less severe and more manageable over time. Vaginal dryness, which is common in perimenopause, can persist.
5. **Fertility:** Women are no longer fertile after menopause. Pregnancy is highly unlikely once menopause is confirmed.

In summary, perimenopause is the transitional phase leading up to menopause and is characterized by hormonal fluctuations, irregular menstrual cycles, and a wide range of symptoms. Menopause, on the other hand, is the point at which menstruation ceases permanently, and hormonal levels stabilize at lower levels. While there are some similarities in symptoms between the two phases, the defining difference is the cessation of menstruation in menopause. Both phases are natural parts of a woman's life, and understanding the distinctions between them can help women navigate these transitions with knowledge and confidence.

The stabilization of hormones after menopause is a critical aspect of the transition that has wide-ranging effects on a woman's body and health. Following menopause, several hormonal changes occur, and these hormones stabilize at lower levels compared to the premenopausal years. Here's a closer look at the hormonal changes and their implications:

1. **Estrogen:** Estrogen is the primary sex hormone in women, and its levels significantly decline after menopause. This decline has several consequences:
  - **Bone Health:** Lower estrogen levels can lead to decreased bone density, increasing the risk of osteoporosis and fractures. Maintaining bone health through diet, exercise, and, in some cases, medication becomes crucial.
  - **Vaginal Changes:** Reduced estrogen can cause vaginal dryness, thinning of vaginal tissues, and discomfort during sexual activity. These symptoms may persist but can often be managed with treatments like vaginal estrogen therapy.
  - **Cardiovascular Health:** Estrogen has cardio-protective effects, and its reduction post-menopause may contribute to an increased risk of heart disease. Managing cardiovascular health through lifestyle changes becomes vital.
2. **Progesterone:** Progesterone levels also decrease significantly after menopause. In the postmenopausal phase, women typically no longer require progesterone, as they no longer have menstrual cycles or reproductive capabilities.
3. **Follicle-Stimulating Hormone (FSH) and Luteinizing Hormone (LH):** FSH and LH levels often increase after menopause as the body attempts to stimulate the ovaries to produce estrogen. This is part of the body's feedback mechanism, but it becomes less effective after menopause.
4. **Testosterone:** While testosterone is primarily considered a male hormone, women also produce

small amounts of it. Testosterone levels may decrease with age, impacting sexual desire and muscle mass, but this change is not as dramatic as the reduction in estrogen.

- 5. Pituitary Hormones:** The pituitary gland increases its production of FSH and LH in response to the decreased ovarian function. This rise in pituitary hormones is a key factor in the hormonal changes seen during menopause.

The stabilization of hormones at lower levels after menopause represents the new hormonal baseline for a woman's body. While it marks the end of reproductive capability, it also brings several health considerations, including the need to monitor bone density, cardiovascular health, and vaginal health. Healthcare providers may recommend hormone replacement therapy (HRT) for some women to alleviate symptoms and reduce the risk of certain health issues associated with hormonal decline. However, HRT also has potential risks and should be considered carefully in consultation with a healthcare provider.

Overall, understanding the hormonal changes that occur after menopause is essential for women to make informed decisions about their health and well-being during this life phase. It's important to focus on preventive measures, lifestyle choices, and regular healthcare check-ups to maintain a healthy and fulfilling postmenopausal life. One of the complexities of menopause is that it happens as we age, so differentiating between hormone-related symptoms and age-related disease symptoms is difficult. With menopause, the answers are never simple so it is important to keep an open line of communication with all physicians on our health team. Below are some symptoms worth mentioning as they also may relate to age-related disease.

<b><i>SYMPTOMS</i></b>	<b><i>POSSIBLE MEDICAL CONDITIONS</i></b>
Abnormal menstrual bleeding	Heart disease
Hot flashes and night sweats	Osteoporosis
Sleep disturbances	Dementia
Temporary cognitive challenges	Depression
Vaginal dryness	Metabolic syndrome
Pain with sex	Type II diabetes
Joint pain	Urinary tract infections

## ***TESTOSTERONE***

Testosterone is often associated with male hormones, but women also produce small amounts of testosterone, primarily in the ovaries and adrenal glands. Testosterone is an androgen or male sex hormone. It promotes the growth and development of male organs and characteristics while also affecting the nervous system, skeletal muscle, bone marrow, skin, and sex organs. Low testosterone is often caused due to being overweight. When body fat levels increase, a carrier hormone called sex-hormone binding globulin gobbles up available testosterone. Drinking too much alcohol may compromise testosterone production. Alcohol induced weight gain increases the action of aromatase which converts testosterone into estrogen, which often increases female characteristics such as increased breast tissue.

Testosterone levels in women tend to decrease with age, and these changes can be influenced by perimenopause and menopause, as well as the stress of the experience itself. All hormones are affected by stress, however, testosterone is especially affected by high stress levels. When stressed, we are constantly in fight-or-flight mode which stimulates cortisol which is a catabolic hormone



which counteracts on the anabolic processes of testosterone.

Testosterone plays many roles in the body as seen in the chart below.

<b><i>Role of Testosterone in the Female Body</i></b>
Works with estrogen to keep bone strong
Aids in effectively building muscle from resistance training
Plays a role in cognitive health
Maintains breast and vaginal health
Improves oxygen uptake
Protects against dementia
Aids in immunity
Improves blood glucose control
Increases libido

Here's what typically happens to testosterone levels during these phases:

**Perimenopause:** During perimenopause, which is the transitional phase leading up to menopause, hormonal fluctuations are common. While estrogen and progesterone levels tend to fluctuate more dramatically, testosterone levels may also show some changes:

- 1. Slight Decline:** Testosterone levels may decrease slightly during perimenopause. This decline is gradual and often part of the natural aging process rather than a direct consequence of perimenopause.
- 2. Impact on Libido:** Some women may experience a decrease in sexual desire during perimenopause, which can be influenced, in part, by changes in testosterone levels. Lower testosterone levels can contribute to reduced libido for some women.
- 3. Mood and Energy:** Testosterone is associated with mood and energy levels. Some women in perimenopause may report mood swings, fatigue, or a decrease in overall vitality, which can be influenced by hormonal changes, including alterations in testosterone.

**Menopause:** After menopause, which is defined as the cessation of menstruation for 12 consecutive months, hormonal changes continue, including those related to testosterone:

- 1. Further Decline:** Testosterone levels continue to decrease after menopause, primarily due to the cessation of ovarian function. The ovaries are the only organ destined to fail so this decline is a natural part of aging and continues into post menopause.
- 2. Impact on Sexual Health:** Lower testosterone levels can contribute to ongoing challenges with sexual desire, vaginal dryness, and overall sexual satisfaction in some women after menopause.
- 3. Muscle Mass and Bone Health:** Testosterone plays a role in maintaining muscle mass and bone density. The gradual decline in testosterone after menopause can contribute to age-related changes in body composition and may affect musculoskeletal health. The loss of skeletal muscle also affects body composition as, for the average person, muscle accounts for 25% of the resting metabolic rate.

There is a natural loss of type II muscle fibers in the body as we age, known as sarcopenia. Making lifestyle changes to help increase testosterone will help decrease the rate at which we lose muscle fibers. Those changes include:

- 1. Incorporating weight training into physical activity:** When training resistance work, incorporate some higher intensity, heavier lifts to naturally increase testosterone levels in the blood. These heavier, more intense lifts should focus on the larger muscle groups and be multi-joint, which allows the muscle fibers to recruit the fast twitch, type II fibers. These are the muscle fibers that undergo sarcopenia as we age.
- 2. Being proactive improving sleep habits:** Because testosterone is made during deep sleep it is important to maximize time spent in the REM stage by avoiding alcohol, positively dealing with stress and keeping a consistent sleep-wake schedule.
- 3. Focusing on a nutritional plan including all macronutrients.** Women who focus on weight loss during or following menopause often are lacking in one or more macronutrients as they attempt various diet plans. It is imperative to eat a well-balanced diet of all macronutrients. We will focus on nutrition in a later chapter.

It's important to note that the changes in testosterone levels during perimenopause and menopause are relatively mild compared to the more significant hormonal fluctuations of estrogen and progesterone. Additionally, not all women will experience noticeable effects on sexual desire, mood, or energy related to testosterone changes.

There are several lifestyle choices that can minimize the decrease in testosterone as we age. For example, in a study in the American Journal of Clinical Nutrition in 2016 (Mumford et al), the higher the polyunsaturated fats (nuts, flaxseed, and fish) contributes to increased concentrations of testosterone. Consistent exercise and sufficient quality sleep also help to increase testosterone levels. Unfortunately, the majority of low testosterone studies are performed with men as test subjects as opposed to menopausal or post-menopausal women.

For women who do experience symptoms related to testosterone decline, healthcare providers may consider hormone replacement therapy (HRT) as a potential option. However, the use of HRT for testosterone replacement in women is generally less common than estrogen and progesterone replacement, and its risks and benefits should be carefully evaluated on an individual basis.

Overall, while testosterone levels do decrease during perimenopause and menopause, their impact on women's health and well-being varies widely among individuals, and treatment decisions should be made in consultation with a healthcare provider.

The age of menopause, while an important milestone in a woman's life, does not have a direct or straightforward correlation with longevity. Longevity is influenced by a complex interplay of genetic, lifestyle, environmental, and healthcare factors. However, there are some nuances to consider:

- 1. Natural Variation:** The age at which women experience menopause can vary widely. On average, menopause occurs around the age of 50, but some women go through menopause earlier (early menopause, before age 45) or later (late menopause, after age 55). Genetic factors and family history can influence the timing of menopause.
- 2. Hormonal Changes:** Menopause marks the end of a woman's reproductive years and is associated with hormonal changes, particularly a decline in estrogen and progesterone levels. These hormonal changes can impact various aspects of health, such as bone density, cardiovascular health, and the risk of certain conditions.
- 3. Health Implications:** Early menopause, especially before the age of 45, may be associated with a slightly increased risk of certain health conditions, such as osteoporosis and cardiovascular disease. These risks can be mitigated through lifestyle choices, including a healthy diet, regular exercise, and, if necessary, hormone replacement therapy (HRT).

- 4. Lifestyle Factors:** Longevity is influenced by lifestyle choices, such as diet, physical activity, smoking habits, and alcohol consumption. These factors can play a more significant role in determining longevity than the age of menopause itself.
- 5. Healthcare Access:** Access to healthcare, preventive screenings, and early detection and treatment of diseases can significantly impact longevity. Regular healthcare visits, vaccinations, and timely management of chronic conditions are essential.
- 6. Genetics:** Family history and genetics play a significant role in determining a person's lifespan. Individuals with a family history of longevity may have a higher likelihood of living longer, regardless of the age of menopause.

In summary, while the age of menopause is an important aspect of a woman's health and can influence certain health risks, it is just one of many factors that contribute to longevity. Lifestyle choices, access to healthcare, genetics, and overall health behaviors are equally, if not more, critical in determining how long a person lives. Maintaining a healthy lifestyle, including regular exercise, a balanced diet, not smoking, and managing chronic conditions, can have a more significant impact on longevity than the specific age at which menopause occurs.



# CHAPTER 3

## Disease & Nutrition During Menopause

Nutrition plays a crucial role in promoting overall health and well-being for women after menopause. After menopause, hormonal changes and aging can influence various aspects of health, including bone health, cardiovascular health, and weight management. Immunity also begins to decrease as we age. The thymus gland, which helps protect the overall immune system, decreases in size so less T-lymphocytes are made. T-lymphocytes are specific white blood cells that fight pathogens and protect from disease. Here are some important disease and nutrition aspects to consider for women in the postmenopausal phase:

### **OSTEOPOROSIS**

Maintaining strong bones becomes increasingly important after menopause, as the risk of osteoporosis and fractures rises. Osteoporosis is a condition in which the bones become weak and brittle. This condition cannot be cured, only treated. For women, a drop in estrogen at the time of menopause is a major cause of osteoporosis. Estrogen controls the modeling and remodeling of bone through the action of osteocytes which are cells that controls osteoblasts and osteoclasts. Osteoblasts are cells that build up bone material and osteoclasts do the opposite, breaking down bone tissue. The body is continuously going through a modeling and remodeling cycle in the bone. Osteopenia is the precursor to osteoporosis and is a loss of bone mineral density and bone mass and can lead to osteoporosis. In addition, to weight bearing exercise, especially with impact, a diet rich in vitamin D and calcium decrease the risk of osteopenia and osteoporosis.

The drop in testosterone, as well as estrogen, plays a role in osteopenia and osteoporosis. As both hormones decrease, they are less effective at inhibiting cytokines (specialized cells) especially IL6 (interleukin 6) which stimulates bone marrow. The stromal cells of the marrow where osteoblasts are produced contain receptors for testosterone. Resistance training helps increase testosterone levels as well as creates pressure on the bones as the muscle pull through the joints.

Resistance training also helps decrease the risk of osteoporosis as strong muscles pull on the bones, making the bones stronger. Protein foods which are made of the building blocks of amino acids are needed to synthesis new muscle tissue. This new muscle tissue is synthesized from amino acids after the tissue has been damaged during exhaustive resistance training. The following vitamins and minerals aid in the production of strong bones and the ability of a muscle to contract:

**CALCIUM and VITAMIN D:** Calcium is a mineral that works hand in hand with vitamin D, increasing the bioavailability in the body and both are essential for bone health. Vitamin D is the only nonessential vitamin, meaning that you can make the required amount in the body without ingesting any of the vitamin through food sources. The body harnesses a hormone when the sunlight meets the melanin in the skin and then transfers it to the liver where a healthy liver can manufacture vitamin D from the initial hormone. Vitamin D not only aids in absorbing calcium from the diet into the body but it regulates blood calcium levels, preventing calcium from being pulled from the bones to maintain

those calcium levels. The following chart shows sources of both calcium and vitamin D.

<b>CALCIUM</b>	<b>VITAMIN D</b>
Leafy greens, rhubarb, broccoli	Liver
Tofu	Red meat
Dairy	Egg yolks
Quinoa	Fortified dairy and orange juice
Carrots, sweet potatoes, and oranges	Cheese
Almonds	Fatty fish
Figs	Fish served with bones
Chickpeas	Shitake mushrooms

Postmenopausal women may experience changes in their dietary habits, or preferences, which can affect their calcium intakes. Some women may consume less dairy products or calcium rich foods. As women age, they also tend to spend less time in the sunlight due to a fear of an increased risk of skin cancer, the most diagnosed cancer in the United States. Lower vitamin D levels may also occur because the body is less able to produce vitamin D in response to sunlight exposure. Hormonal changes before, during and after menopause can affect calcium absorption and utilization. Lower estrogen levels can impair calcium absorption in the intestines, making it even more important to ensure an adequate dietary intake of both calcium and vitamin D. In cases where dietary calcium intake is insufficient or exposure to sunlight is limited, health care providers may recommend supplements. It is important to discuss this with a registered dietician or other medical practitioner after a blood test so that a proper dosage can be determined.

**PROTEIN** is a critical nutrient for women at all stages of life, including after menopause. While protein needs may not necessarily increase dramatically after menopause, there are several reasons why it remains essential for postmenopausal women:

- **Maintaining Muscle Mass:** As women age, they naturally experience a gradual loss of muscle mass and strength, a condition known as sarcopenia. Sarcopenia normally occurs within the type II, fast-twitch, fibers in our muscle tissue which are responsible for the more intense, powerful movements that we often stop including in our activities as we age. Protein is crucial for muscle maintenance, repair, and growth. Adequate protein intake can help counteract age-related muscle loss and support muscle function.
- **Bone Health:** Protein is a vital component of bone tissue and plays a role in maintaining bone health. Adequate protein intake is essential for the synthesis and repair of bone tissue, which is particularly important for postmenopausal women who are at an increased risk of osteoporosis and fractures.
- **Metabolic Health:** Protein has a higher thermic effect than carbohydrates or fats, which means it requires more energy for digestion and metabolism. This can help support healthy metabolism and weight management, which can be challenging for some women after menopause due to hormonal changes.
- **Satiety and Weight Management:** Protein-rich foods are often more satiating, helping to control appetite and reduce the likelihood of overeating or excessive snacking. This can be beneficial for managing body weight and preventing unwanted weight gain, which is common after menopause.
- **Hormonal Changes:** After menopause, hormonal changes, including a decrease in estrogen, can influence body composition. Protein can help support muscle mass, which in turn can have a

- positive impact on metabolic and hormonal balance.
- **Immune Function:** Protein is essential for a robust immune system. Ensuring an adequate protein intake can help support the body's ability to defend against infections and illnesses, which becomes especially important as people age.
- **Wound Healing and Tissue Repair:** Protein is crucial for tissue repair and wound healing. Postmenopausal women may experience slower healing times for injuries or surgeries, making sufficient protein intake vital for recovery.
- **Cognitive Function:** Some research suggests that protein intake may have a positive influence on cognitive function and memory, which can be important for brain health as women age.

To meet protein needs, postmenopausal women should include a variety of protein-rich foods in their diet, such as lean meats, poultry, fish, dairy products, eggs, legumes (beans, lentils, chickpeas), tofu, tempeh, nuts, and seeds. It's important to focus on lean sources of protein to limit saturated fat intake; poultry, fish, beans, tofu, and dairy products. To help navigate the best sources of protein, there is a Protein Digestibility-Corrected Amino Acid Scale (PDCAAS) available online which rates protein sources from superior to inferior sources of protein. Eggs consistently score as superior sources of protein.

The recommended daily protein intake can vary based on factors such as age, activity level, and overall health. The RDA, the amount of a nutrient needed to keep people free of disease, of protein is .8 grams/kg of body weight per day. In 2018, there was a study published in the American Journal of Clinical Nutrition regarding the RDA of protein for the average person. It appears, from this study, that .8 grams per kilogram of body is more than adequate. This study cited 0.36 for every pound appeared to be enough for health purposes especially if carrying extra weight, which two-thirds of the US population does. The average woman gets 35% more than enough and the average man gets 65% more. This holds true for all ages until we reach age 70+. It's advisable for postmenopausal women to consult with a registered dietitian or healthcare provider to determine their specific protein needs and develop a balanced dietary plan that aligns with their individual health goals and requirements.

## ***CARDIOVASCULAR DISEASE (Coronary Artery Disease)***

Cardiovascular disease, specifically coronary artery disease, is the number one leading cause of death in the United States. Coronary artery disease is an inflammation and blocking of the blood vessels that supply blood to the actual heart muscle. It may be caused by a blocking of the vessel due to cholesterol, plaque, calcium and fibrin or a rupture in the actual vessel due to high blood pressure. A woman's risk for heart disease increases after menopause as estrogen is a major contributor to the pliability of vessels as well as being an anti-inflammatory agent throughout our systems. Obesity is also a major contributor to heart disease and the percent of body fat in women tends to rise after menopause.

**FIBER** is a component of complex carbohydrates and is further classified as soluble and insoluble fiber. Fiber cannot be broken down by human digestive enzymes and, therefore, cannot be digested in the small intestine so it passes into the large intestine. Insoluble fiber will be excreted virtually the same way it was ingested. Because it is not soluble in the water of the body, it produces bulk in the large intestine and stimulates a bowel movement. Examples are apple peels, the outside of the corn kernel and the string of celery. Soluble fiber will be changed in the digestion process by the action of intestinal microflora. Soluble fiber will help eliminate bile from the digestive tract. Therefore, the liver will need to make additional bile to help breakdown fats. In the making of bile, cholesterol is used. Therefore, the ingestion of soluble fiber actually helps lower total cholesterol levels. This is

especially important following menopause as a 2020 study (Inaraja et al:2020) found that levels of total cholesterol, LDL cholesterol and triglycerides are much higher in women after menopause, compared with those in earlier stages of life. HDL levels were also reduced. Estrogen helps regulate the metabolism of lipids in the liver. As a result, the drop in estrogen levels during menopause leads to higher LDL cholesterol and triglyceride levels. This increases the risk for heart disease. The ratio of LDL to HDL is the diagnostic test that determines possible inflammation which is a sign of heart disease.

Fiber helps regulate digestion and can aid in managing weight, as well as decreasing the risk for heart disease. Incorporating both soluble and insoluble fiber can decrease the risk of type II diabetes, diverticulitis, colon-rectal cancer, hemorrhoids, and heart disease caused from high cholesterol levels. Increasing your fiber intake needs to be done slowly to avoid constipation. Increasing the intake of whole grains, vegetables, and fruits (including the peels when possible) will increase your fiber intake. Dietary fiber is an essential component of a healthy diet for women, particularly after menopause. While women's fiber needs do not necessarily increase dramatically after menopause, several factors make adequate fiber intake even more important during this life stage:

- **Weight Management:** Weight management can become more challenging after menopause due to hormonal changes and a slower metabolism. Fiber-rich foods are often low in calories but highly satiating, helping women feel full and satisfied, which can assist in weight control.
- **Blood Sugar Control:** Fiber-rich foods, especially those containing soluble fiber, can help stabilize blood sugar levels by slowing down the absorption of sugars from the digestive tract. This is particularly important for women who may be at an increased risk of developing insulin resistance or type 2 diabetes after menopause.
- **Heart Health:** Postmenopausal women face an elevated risk of heart disease. Dietary fiber, especially soluble fiber found in oats, legumes, and certain fruits, can help lower LDL cholesterol levels, reduce blood pressure, and support overall cardiovascular health.
- **Hormone Balance:** Some types of dietary fiber, such as lignans found in flaxseeds, may have mild estrogen-like properties. These natural compounds can help modulate hormone levels in the body, potentially alleviating some menopausal symptoms. Cruciferous vegetable fiber, also binds sulfur to estrogen, making it ineffective in the body and unable to bind to receptors. Quercetin in garlic and onions inhibit enzymes that synthesize estrogen, aiding in hormone balance.
- **Gut Microbiome:** A healthy gut microbiome is crucial for overall health. Dietary fiber serves as a prebiotic, nourishing beneficial gut bacteria. A diverse and balanced gut microbiome is associated with numerous health benefits, including enhanced immune function and improved digestion. Polyphenols in plants also inhibit bad bacteria in the gut and curb inflammation while lowering CRP.
- **Bone Health:** Calcium absorption in the intestines can be influenced by fiber intake. High-fiber diets, particularly those high in phytic acid (found in certain grains and legumes), may reduce calcium absorption. However, this effect is generally minimal and can be mitigated by consuming calcium-rich foods.

To ensure an adequate fiber intake, postmenopausal women should focus on incorporating a variety of fiber-rich foods into their diets, including:

- **Whole Grains:** Choose whole grains like oats, brown rice, quinoa, whole wheat bread, and whole-grain pasta.
- **Fruits:** Consume a wide range of fruits, particularly those with edible peels, such as apples, pears, and berries.

- **Vegetables:** Incorporate a diverse selection of vegetables, including leafy greens, cruciferous vegetables, carrots, and bell peppers.
- **Legumes:** Include beans, lentils, chickpeas, and peas in your meals.
- **Nuts and Seeds:** Snack on nuts and seeds or add them to salads and yogurt.

It's essential to increase fiber intake gradually to allow the digestive system to adjust and prevent gastrointestinal discomfort. Drastically increasing fiber intake too quickly can lead to constipation. Drinking plenty of water is also crucial to aid in the digestion and absorption of dietary fiber.

Overall, a fiber-rich diet can provide various health benefits for postmenopausal women, supporting digestive health, weight management, heart health, and overall well-being. Consulting with a registered dietitian can help tailor dietary recommendations to individual needs and health goals.

**OMEGA 3 FATTY ACIDS:** Omega-3 fatty acids have cardiovascular benefits and may help reduce inflammation. These are essential fatty acids that our bodies cannot make and have to be eaten. There are three types: EPA, DHA and ALA. Include sources like fatty fish (salmon, mackerel), flaxseeds, chia seeds, and walnuts in your diet. Omega-3 fatty acids are essential polyunsaturated fats that play a crucial role in overall health. EPA increases cerebral blood flow while DHA increases membrane fluidity, increases glucose uptake and neuron growth. While the need for omega-3 fatty acids doesn't necessarily increase dramatically after menopause, they remain important for postmenopausal women due to several specific reasons:

- **Heart Health:** Postmenopausal women are at an increased risk of heart disease. Omega-3 fatty acids, particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) found in fatty fish like salmon, mackerel, and sardines, have been shown to have cardio-protective effects. They can lower triglyceride levels, reduce inflammation, improve blood vessel function, and help regulate blood pressure, all of which contribute to better heart health.
- **Cholesterol Management:** Omega-3s can help improve the lipid profile by increasing levels of HDL (high-density lipoprotein or "good" cholesterol) and reducing levels of LDL (low-density lipoprotein or "bad" cholesterol). This is especially important for postmenopausal women, as they may experience unfavorable changes in cholesterol levels after menopause. Omega 3s, classified as unsaturated fats are naturally occurring, usually liquid at room temperature and come from plants. Exceptions include fish oil, avocados and nuts and nut oils. The chemical makeup is usually curved and not all hydrogen binding sites are filled. A double bond will always exist in unsaturated fats' chemical makeup. This makes unsaturated fats less dangerous to heart health. HDL cholesterol plays a role in decreasing LDL levels through the process of reverse transport. HDL particles leave the liver to scavenge the blood stream for LDL particles. Once found, the HDL returns the LDL particles to the liver, leaving the arteries clean of plaque and LDL buildup. Once returned to the liver, the cholesterol is used to produce substances such as bile, vitamin D, and reproductive hormones. This process of reverse transport also happens when the body is deprived of cholesterol, pulling cholesterol out of the plaque in the arteries. Plaque is composed not only of cholesterol but also fibrin and white blood cells. The process is illustrated below.
- **Blood Pressure Control:** Hypertension (high blood pressure) becomes more common with age, and postmenopausal women are at an increased risk. Omega-3 fatty acids may help lower blood pressure and reduce the risk of hypertension-related complications. This increased blood pressure in uncontrolled hypertension decreases the ability of arteries to expand, increasing the risk of a stroke or a heart attack if a vessel is blocked. The inner layer of the artery is called the intima and it should be smooth. As plaque grows, the intima becomes rough and inflammation occurs. Inflammation and immune cells make the plaque unstable and more likely to erupt off



the wall to float free in the vessel. Inflammation causes immune cells to raid the site, where they consume LDL cholesterol and homocysteine, growing and hardening into plaque, a disease state called atherosclerosis. The immune cells also produce a substance which wears away the cap of the plaque. It eventually blows, leaving an open wound which scabs over called a thrombus. This can block or break free and move into another artery, causing a stroke. There are multiple diagnostic labs to test for inflammation levels. Lowered levels of the amino acid homocysteine, made in the liver, represent less inflammation and elevated levels represent inflammation in the arteries. Elevated homocysteine increases the viscosity of the blood, decreasing elasticity and increases the tendency to form clots. A CRP (complement reactive protein) test measures the liver's production of this substance in response to inflammation.

- **Anti-Inflammatory Effects:** Chronic inflammation is associated with various age-related diseases, including heart disease, arthritis, and certain cancers. Omega-3s possess anti-inflammatory properties and can help mitigate the inflammatory processes in the body.
- **Bone Health:** Omega-3s may contribute to better bone health. Postmenopausal women are at an elevated risk of osteoporosis, and some studies suggest that omega-3s can enhance bone density and reduce the risk of fractures.
- **Cognitive Health:** Cognitive decline is a concern as women age. Omega-3 fatty acids, particularly DHA, are important components of brain cell membranes and may support cognitive function and reduce the risk of age-related cognitive decline and neurodegenerative diseases.
- **Mood and Mental Health:** Postmenopausal women may experience mood swings, anxiety, and depression. Omega-3s have been studied for their potential to improve mood and reduce symptoms of depression and anxiety.

To ensure an adequate intake of omega-3 fatty acids, postmenopausal women can consider the following dietary strategies:

- **Fatty Fish:** Incorporate fatty fish like salmon, mackerel, trout, and sardines into your diet at least two times a week.
- **Plant-Based Sources:** Include plant-based sources of omega-3s such as flaxseeds, chia seeds, walnuts, and hemp seeds in your diet.
- **Supplements:** If it's challenging to obtain sufficient omega-3s from dietary sources, consider omega-3 supplements. Consult with a healthcare provider before starting any supplement regimen to determine the appropriate dosage and type of supplement (fish oil, algae-based, etc.).

Balancing omega-3 fatty acids with other dietary fats, such as monounsaturated and polyunsaturated fats, is important for overall health. It's advisable for postmenopausal women to consult with a registered dietitian or healthcare provider to determine their specific omega-3 needs.

While the prior disease states have lowered risks of occurrence with the nutrients mentioned, there are also other components to a healthy diet that can increase the quality of life after menopause:

1. **Healthy Fats:** Focus on monounsaturated and polyunsaturated fats found in sources like olive oil, avocados, nuts, and seeds. Limit saturated and trans fats to promote heart health. Healthy fats which can increase HDL levels actually act as scavengers in the blood stream to bring harmful LDL back to the liver where it is reused to make bile, vitamin D and/or steroidal hormones such as testosterone, progesterone or estrogen.
2. **Phytoestrogens:** Some foods contain natural plant compounds called phytoestrogens that can mimic the effects of estrogen in the body. Plants also contain sterol compounds which mimic progesterone. Foods like soy products (tofu, edamame), flaxseeds, and legumes may help

alleviate some menopausal symptoms. Plant foods also contain polyphenols which are a class of compounds that include flavonoids, and thousands of others types. They act as antioxidants combating free radicals in the body. This lowers the inflammation levels, protecting against development of certain cancers, cardiovascular diseases, diabetes and neurodegenerative diseases. Ellagic acid is a well -studied polyphenol in berries and nuts known for antioxidant and anticancer properties.

3. **Iron:** Postmenopausal women generally require less iron than premenopausal women. Consume lean meats, poultry, fish, and iron-rich plant-based sources like fortified cereals, spinach, and beans, but be mindful not to exceed recommended levels.
4. **B Vitamins:** B vitamins, including B6, B12, and folate, are important for overall health. Incorporate foods like fortified cereals, leafy greens, and lean proteins to ensure an adequate intake. Vegetables contain a large percentage of B vitamins and other micronutrients. Micronutrients of vitamins and minerals (especially magnesium) play a major role in controlling hormones (especially cortisol).
5. **Probiotics:** Probiotic-rich foods like yogurt and fermented foods can support digestive health, which can be beneficial as digestion may change with age. Increase your root vegetables to feed your probiotic bacteria with prebiotic foods.
6. **Hydration:** Staying well-hydrated is crucial for overall health, as dehydration can affect kidney function and increase the risk of urinary tract infections. Aim for adequate water intake throughout the day.
7. **Limit Added Sugars and Sodium:** Reducing the consumption of foods high in added sugars and sodium can help manage weight, maintain heart health, and prevent hypertension. The DASH diet can help you control added and natural sodium in your nutritional plan if sodium and high blood pressure are most menopausal issues.
8. **Limit Alcohol Intake:** The most important factor about alcohol and health is how much you drink. Some benefits to the heart come with moderate drinking and the National Institute on Alcohol Abuse and Alcoholism, NIAA) define moderate drinking for women (low risk) is not more than seven drinks per week and no more than three drinks on any single day. A drink is defined as 5 fluid oz of wine, 12 fluid oz of beer or 1.5 fluid ounces of 80-proof distilled spirits. Moderate drinking for women has shown some benefits to the heart due to the polyphenol, resveratrol, in the grapes. However, any amount of alcohol increases the risk of breast cancer as well as other cancers. More than moderate drinking can increase the risk of osteoporosis, cardiovascular disease, central obesity, organ damage, type ii diabetes, and depression.

It's essential to remember that individual nutritional needs can vary, so it's advisable to consult with a registered dietitian or healthcare provider to create a personalized nutrition plan tailored to your health goals and any specific concerns you may have during the postmenopausal phase.



# CHAPTER 4

## Stress, Cortisol & Menopause

Cortisol is a steroid hormone produced by the adrenal glands in response to any type of stress and to regulate various physiological processes in the body. Cortisol is a major player in the metabolism game. While most people think of stress as negative, or distress, there is also positive stress, or eustress, which affects the body in the exact same way. The years of perimenopause and menopause bring about many stressful events, both negative and positive: the marriage or children, the birth of grandchildren, the death of parents, retirement, etc. Some women simply stress once the signs and symptoms of menopause begin. Excessive overtraining or exercise also increases cortisol levels and women often tend to increase their volume, intensity, and duration once signs and symptoms begin in an effort to combat weight gain.

Cortisol is a stress hormone which stimulates gluconeogenesis. Gluconeogenesis is the creation of a glucose from a non-carbohydrate source such as amino acids, glycerol, or lactic acid. Cortisol also inhibits the use of glucose by most body cells which, in turn, initiates the catabolism of protein. An increase in cortisol is related to decreased rate of muscle hypertrophy due to an increased rate of protein catabolism (an unwanted breakdown of muscle tissue). Ingesting protein in the morning can reduce cortisol and therefore reduce the possible catabolic state. The same principle applies if protein is ingested 3-4 hours after a workout and later in evening.

Elevated cortisol levels also activate lipolysis in times of fasting when liver glycogen is low. This helps preserve glucose levels but may also cause a metabolic rate to decrease as well as decreasing the intensity of fasting exercise.

Three regions of the brain control the stress response: the amygdala, which detects threat and triggers the fight-or-flight response, the prefrontal cortex, which helps us deal calmly with stress, and the hippocampus which supports stress recovery. Chronic stress can change these brain regions to make us more sensitive and less resilient to stress. High levels of stress hormones are neurotoxic to the prefrontal cortex or hippocampus, can reduce the connections between brain cells and can even kill brain cells. As these areas weaken, the brain gets worse at managing stress. Chronic stress has the opposite effect on the amygdala, the brain's threat detector, making it grow, increasing the connections between brain cells and heightening cell excitability. This makes the brain even more reactive to stress. These brain changes are associated with disorders ranging from depression to accelerated aging. Aging is thought to be controlled by the telomeres on the ends of the chromosomes. Each time a cell replicates itself, it loses a bit of its DNA. To make sure important DNA isn't lost, the ends of DNA strands are protected by telomeres. Spare DNA can be sacrificed without damaging the cell's ability to replicate so telomeres protect the integrity of DNA. Telomeres will eventually get shorter causing cell death and dysfunction. Psychological stress speeds up the rate of telomere shortening and slows down the process for repairing telomeres. Telomere damage increases inflammation and circulating cytokines so the risk for disease increases.

While cortisol levels tend to remain relatively stable throughout most of a woman's life, there can be some changes during perimenopause and menopause:

## Perimenopause:

- 1. Hormonal Fluctuations:** Perimenopause is marked by significant hormonal fluctuations, particularly in estrogen and progesterone levels. These hormonal changes can indirectly influence cortisol levels because estrogen and progesterone can modulate the stress response system.
- 2. Stress Response:** Some women may experience increased stress and anxiety during perimenopause, which can lead to fluctuations in cortisol levels. Chronic stress can elevate cortisol levels, potentially contributing to symptoms like mood swings and sleep disturbances.
- 3. Sleep Disruptions:** Sleep disturbances are common during perimenopause, and poor sleep can affect cortisol regulation. Cortisol follows a diurnal rhythm, with levels highest in the morning and gradually declining throughout the day. Sleep disruptions can disrupt this rhythm, leading to abnormal cortisol patterns.

## Menopause:

- 1. Stabilization:** After menopause, hormonal fluctuations typically stabilize as estrogen and progesterone levels remain consistently low. This can lead to a more stable cortisol profile compared to the hormonal fluctuations of perimenopause.
- 2. Stress and Lifestyle Factors:** Stress management and lifestyle factors become increasingly important after menopause. High levels of stress, poor sleep, and unhealthy lifestyle choices can impact cortisol levels. Effective stress management techniques, such as mindfulness, relaxation exercises, and regular exercise, can help support healthy cortisol levels.
- 3. Metabolic Changes:** Some women may experience changes in metabolism and body composition after menopause, including an increased tendency to store fat around the abdomen. Elevated cortisol levels, often associated with chronic stress, can contribute to abdominal obesity, which is a risk factor for metabolic conditions like type 2 diabetes and cardiovascular disease. The heart prefers fat as a fuel but when cortisol levels are high, the excess glucose floods the heart causing excess fat to be stored as adipose.

It's important to note that the changes in cortisol levels during perimenopause and menopause are generally subtle and not the primary cause of menopausal symptoms. The primary drivers of menopausal symptoms are the hormonal changes, particularly the decline in estrogen. However, stress management and maintaining a healthy lifestyle, including regular exercise, balanced nutrition, and adequate sleep, are crucial for overall well-being during this life stage and can indirectly support healthy cortisol regulation.

If women experience significant stress, mood disturbances, or sleep disturbances during perimenopause or menopause, it's advisable to seek support from healthcare providers or mental health professionals who can provide guidance on stress management and coping strategies to help maintain overall health and well-being. Popular stress management strategies include journaling, meditation, yoga, exposing the body to sunlight, block breathing and spending time with a pet.

One of the most dangerous outcomes of a chronically high cortisol level is a decrease in immunity, the body's ability to fight off pathogens and resulting diseases. The relationship between nutrition and immune health is still evolving but researchers do know that the following nutrients can help boost the immune system.

- 1. Vitamin C:** As an antioxidant, vitamin C helps prevent damage to healthy cells from oxidation generated during the destruction of potential pathogens. It also supports the health of T-cells

and B-cells, fighters in the immune war in the body. Studies suggest a possible benefit in reducing the incidence and severity of respiratory illness, especially in older adults. Vitamin C also plays an important role in the immune's response to stress. It stimulates white blood cells and liver enzymes. White blood cells fight infection, and the liver plays a role in filtering out harmful toxins. When stressed, the hypothalamus, pituitary and adrenal glands work together as the HPA axis to release cortisol. Vitamin C is used by the adrenals when cortisol is produced. When chronically stressed, the vitamin C reserve is depleted quickly. Low levels of vitamin C in the body are a stressor as well, which starts the cycle all over again. Ingesting fresh fruits and vegetables and supplementing, if needed, can optimize your immune system.

2. **Vitamin D:** The active form of vitamin D helps produce antiviral peptides in mucous membranes, inhibition of proinflammatory cytokines and stimulation of certain T-cells. A University of Edinburgh research team found that vitamin D affects the dendritic cells' ability to activate T cells. T cells play an active role in fighting infections of pathogens. Foods high in vitamin D include the egg yolk, mushrooms, milk salmon and yogurt. Exposure to sun also increases vitamin D levels.
3. **Vitamin E:** Cells in the immune system contain high levels of this fat-soluble antioxidant which kills free radicals. Vitamin E is also known to reduce inflammation, protect cell membranes, and is associated with the health of macrophages. The best sources are almonds, seeds, vegetable oils and leafy greens.
4. **Zinc:** The mineral zinc is highly active in immune health with anti-inflammatory, antifungal and antiviral functions. It has been shown to lessen the intensity and duration of illnesses. Foods high in zinc include oysters, red meat, poultry, seafood, nuts, and whole grains. Alcohol actually decreases zinc activity so partaking in recreational drinking will not aid your immune system.
5. **Probiotics:** The GI tract and its mucosa creates a physical barrier for pathogens passing from the gut into the bloodstream. Beneficial gut bacteria colonize the colon and increase immunity. Examples of probiotics include active bacteria yogurt, kefir, kimchi, miso, kombucha, pickles, and tempeh.

Exercise can have a significant impact on cortisol levels during menopause, and the relationship between exercise and cortisol is complex. Cortisol is a hormone that the body produces in response to stress, and exercise can be a form of physical stress. Here's how exercise during menopause can affect cortisol levels:

### 1. **Acute Response to Exercise:**

- When you engage in physical activity, especially intense or prolonged exercise, cortisol levels typically rise temporarily. This is a normal part of the body's stress response to exercise, and it helps mobilize energy and manage inflammation during physical exertion.

### 2. **Regular Exercise and Cortisol Regulation:**

- Regular exercise, when incorporated into a consistent routine, can help regulate cortisol levels. Over time, the body becomes more efficient at managing the stress response, and cortisol levels may return to baseline more quickly after exercise.

### 3. **Stress Reduction:**

- Exercise is known to be a stress reducer. It can help alleviate symptoms of stress, anxiety, and depression, which can be common during menopause. By reducing psychological stress, exercise may indirectly help regulate cortisol levels.

### 4. **Improvement in Sleep Quality:**

- Menopausal women often experience sleep disturbances. Regular exercise can promote better sleep quality, and getting adequate sleep is important for cortisol regulation. Sleep disturbances can lead to elevated cortisol levels, and exercise can help mitigate this effect.

## **5. Weight Management:**

- Maintaining a healthy weight and body composition through exercise can help prevent or reduce abdominal obesity, which is associated with elevated cortisol levels. Abdominal obesity is a risk factor for metabolic conditions like type 2 diabetes and cardiovascular disease.

## **6. Bone Health:**

- Weight-bearing exercises, such as walking, jogging, or resistance training, are important for maintaining bone density during menopause. Exercise can help reduce the risk of osteoporosis, which is linked to imbalances in cortisol levels.

## **7. Strengthening Overall Health:**

- Regular exercise has numerous health benefits, including improved cardiovascular health, reduced inflammation, and better blood sugar control. These factors can indirectly influence cortisol levels by promoting overall health and reducing the physiological stress on the body.

It's important to note that the relationship between exercise and cortisol is highly individualized. Some people may experience a more pronounced cortisol response to exercise, while others may have a more muted response. Factors such as exercise intensity, duration, and individual stress levels all play a role.

For most menopausal women, a well-rounded exercise routine that includes a mix of aerobic (e.g., walking, cycling) and strength-training (e.g., resistance exercises) activities is beneficial. It's also crucial to listen to your body and choose activities that you enjoy to help make exercise a sustainable and enjoyable part of your routine.



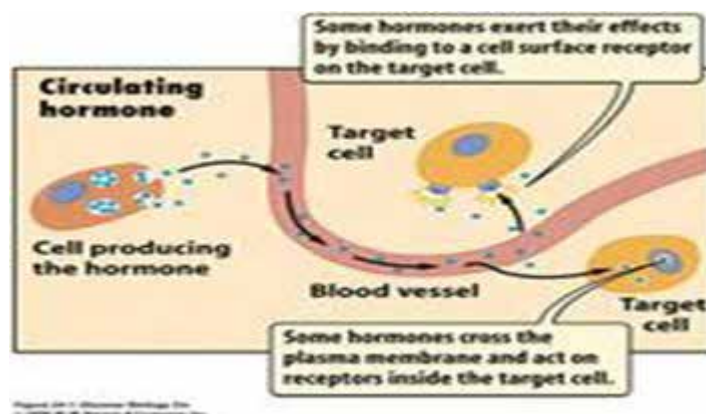
# CHAPTER 5

## Other Hormones Influencing Metabolism & Weight

A hormone is a substance that is produced somewhere in the body and travels to another, looking for a receptor to make a change occur in another part of the body. Hormones basically help cells communicate with each other. These messengers control most major bodily functions, from simple basic needs like hunger to complex systems like reproduction, and even the emotions and mood. Understanding the major hormones involved with metabolism and appetite regulation will help control weight gain and overall health postmenopausal. Endocrine glands, which are special groups of cells, make hormones. The major endocrine glands are the pituitary, pineal, thymus, thyroid, adrenal glands, and pancreas. In addition, men produce hormones in their testes and women produce them in the ovaries. The initial contact a hormone makes with a cell starts a series of important reactions carried out within that specific cell or tissue.

Some of the activities of hormones include:

- Prompting cell or tissue growth and development
- Helping with food metabolism
- Initiating and maintaining sexual development and reproduction
- Maintaining body temperature
- Controlling thirst
- Regulating mood and cognitive functioning



For our purposes in the fitness arena, we will be focused on tissue growth and food metabolism. We will be concentrating on both the hormones which control metabolism as well as appetite. When satiety hormones get out of control, all other metabolic processes are affected also.

The hypothalamus is the part of the brain that is the site of processing for signals rewarding food intake. It may even regulate a set point for a healthy weight of the body mass. The many control centers in the hypothalamus are controlled by feedback of other things in the body such as blood glucose concentrations and the presence or absence of certain hormones.

## ***Satiety/ Appetite Regulating Hormones***

**Leptin** is a regulatory hormone produced in the fat cells (known as an adipokine) and when released into the circulation, it influences the hypothalamus to control appetite. Leptin is also an indicator of energy balance, as its circulating concentrations are proportional to body fat. Therefore, leptin is produced in proportion to body fat stores. When body fat increases, leptin is released into the blood stream, travels to the brain and then inhibits neuropeptide Y. Neuropeptide Y is a neurotransmitter that stimulates food intake and may decrease energy expenditure. Aging is associated with declining serum leptin levels, independent of body mass index (BMI), as well as with the development of leptin resistance (Isidori et al., 2000)

**Ghrelin** is a hormone secreted by the stomach and pancreas to increase appetite. It is usually stimulated prior to eating and acts on the hypothalamus to stimulate the feelings of hunger. Ghrelin levels rise primarily in response to acute sleep deprivation, while leptin levels fall with chronic sleeplessness. A single night of poor sleep causes acute rises in ghrelin levels, but leptin concentrations remain essentially the same. Early studies on ghrelin show that greater amounts may actually decrease the metabolic rate, making quality sleep of utmost importance to avoid excessive weight gain.

## ***Endocrine/Exocrine Hormones***

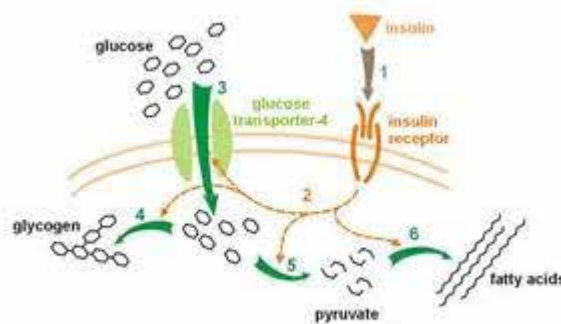
**Thyroid Stimulating Hormone (TSH)** - Hypothalamus neurons secrete TRH to stimulate the anterior pituitary gland. The anterior pituitary gland secretes TSH. Then TSH binds to receptors on thyroid gland, stimulating synthesis and secretion of thyroid hormones, which affect all cells in the body. When blood concentrations of thyroid hormones increase above threshold, TRH secreting neurons in the hypothalamus stop secreting TRH. An enlarged thyroid can end up releasing too many hormones causing dysfunction.

**Insulin** is a hormone secreted by the pancreas that controls carbohydrate metabolism. When cells become resistant to insulin, the surface receptors begin to malfunction, insulin levels increase, encourage kidney fluidity, increase cholesterol and triglycerides, and thicken artery walls. As we enter menopause, this becomes even more dangerous to the cardiovascular system. From a health standpoint, repeatedly overloading the bloodstream with sugar places extra demand on the pancreas to keep secreting more insulin. Hyperinsulinemia may lead to insulin resistance in which normal amounts of insulin are inadequate for transferring blood glucose into cells and risk of Type II diabetes goes up. Type II diabetics increase the risk of Alzheimer's because of the inflammation and because too much insulin in the brain can stimulate B-amyloid buildup. Beta amyloid molecules are protein fragments that clog neurofibrillary tangles in the brain.

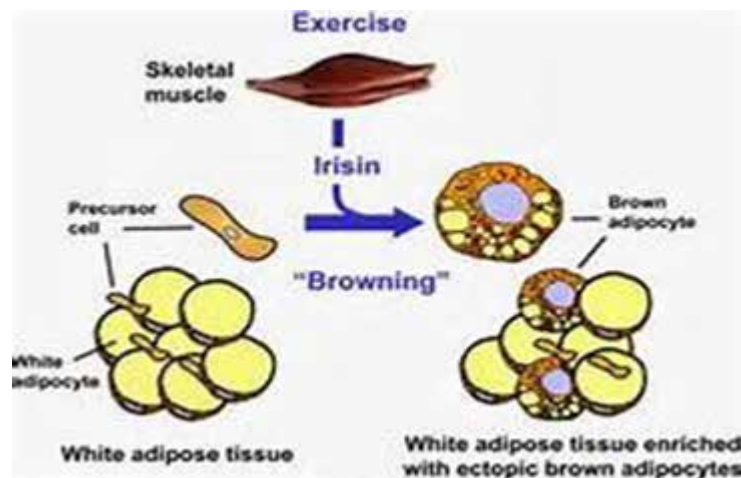
The more a person is overweight, the worse the insulin sensitivity. This leads to high levels of insulin in the blood stream which directly inhibits the body's primary fat-burning enzyme called hormone-sensitive lipase, which makes the burning of fat less efficient. Poor insulin sensitivity is also strongly associated with lower testosterone levels. High insulin levels also shift the body's testosterone to a far weaker form called androstenedione which takes up receptor sites for regular testosterone. Insulin resistance fat gain is associated with higher levels of estrogen, making exercise and weight control extremely important following menopause since fat cells increase estrogen levels in the body and chronically high levels of estrogen increase the risk of feminine cancers.



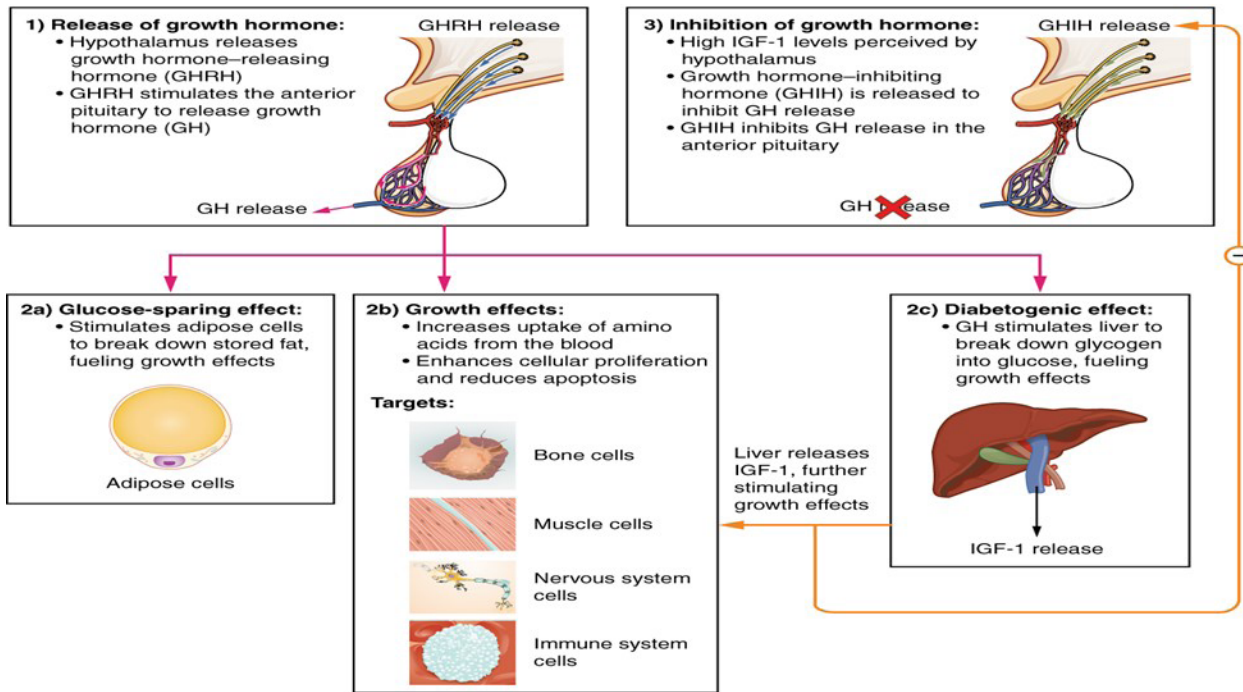
Insulin also plays a role in keeping fat inside the cells after we eat. Fat resides in adipose cells just under the skin and in visceral areas. Most are triglycerides with a backbone of glycerol and three FA tails. After we eat, insulin keeps fat, or these triglycerides, inside the cell. During fasting or exercise, insulin drops, epinephrine increases, and lipolysis begins to break off the glycerol molecule so fatty acids can enter the blood stream. The primary fat carrier in the bloodstream is albumin because fat is not soluble in water. The blood plasma is made of water so without albumin, the fat cannot be transported to a muscle cell for lipolysis in the mitochondria. In capillaries, fatty acids are removed from albumin and carried into muscle cells, crossing the epithelium of the capillary and the sarcolemma of the muscle. Once inside a muscle cell, acetyl CoA transports and prepares fat for either oxidation to produce energy or to be stored as intramuscular fat storage. Fats are stored more in slow twitch fibers (2-3x times more than fast twitch) and, also more so in women than men.



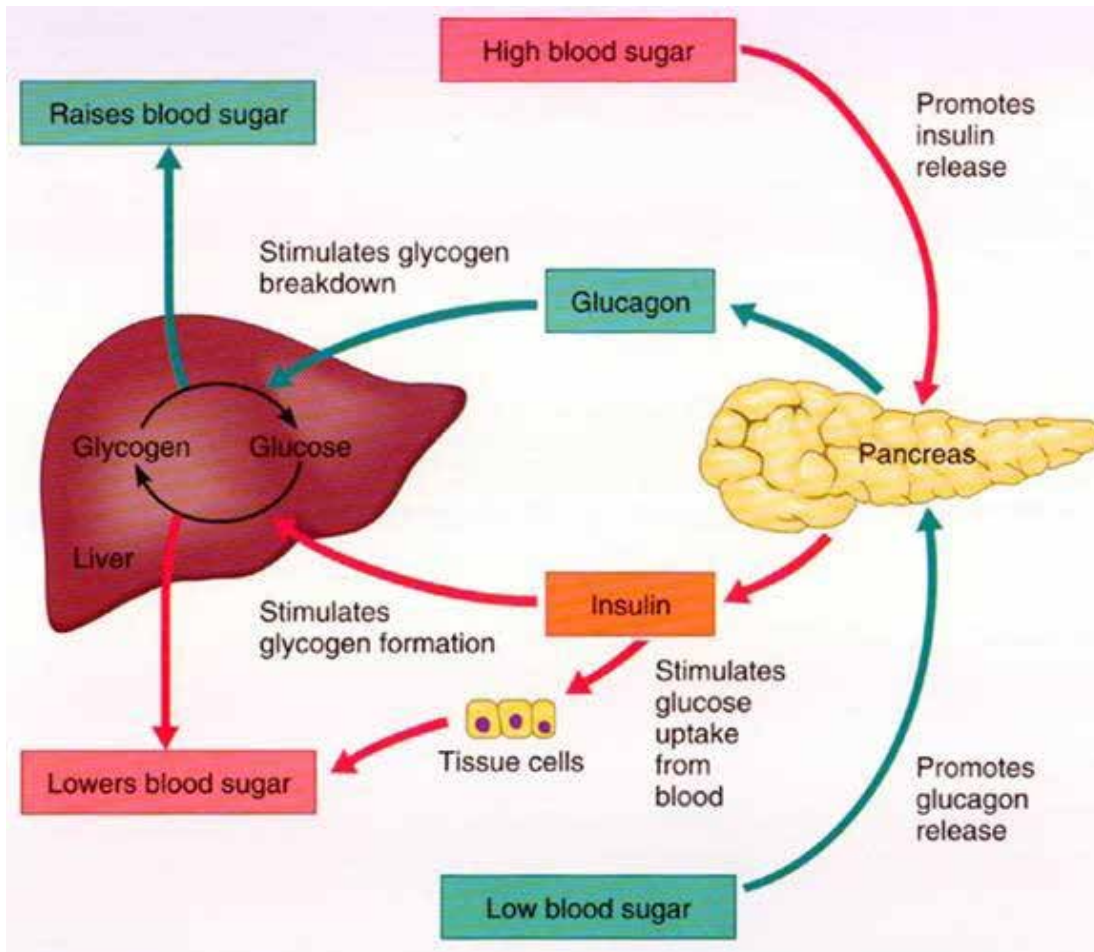
**Irisin** is a hormone produced in response to exercise. It is theorized to turn white fat cells into brown fat cells. Brown fat is distinctly different from white and is most often found in the neck and chest area of adults. Brown fat has a high rate of metabolism in the form of heat without the production of ATP. Activation of brown fat increases in the presence of a cold atmosphere. It has the same properties of the brown fat found in infants, which we call “baby fat” and is used to keep infants warm since they cannot adjust their environmental conditions. The amount of brown fat in the body decreases with aging.



**Human Growth hormone** is a peptide (protein-like) hormone made up of 191 amino acids. It is taken up by the liver and converted to somatomedin-c, also known as IGF – 1 that is found in skeletal muscle. IGF regulates insulin metabolism while GH promotes satellite cell activation which is the theory as to how a muscle cell hypertrophies. IGF is more stable in the body so often more readily measured than growth hormone. Normal levels of IGF range from 300-450 ng/ml. IGF is a hormone that is needed in moderate amounts, however, there is a dangerous side to both extremely high or low amounts.



**Glucagon** -the second hormone of the pancreas: stimulates the breakdown of glycogen in the liver and promotes gluconeogenesis- the formation of glucose from amino acids and fatty acids. The effect is to remove amino acids from blood. Basically exerts opposing actions to insulin. It responds to periods of hypoglycemia and increases blood sugar levels.





# Chapter 6

## Programming for Menopausal Fitness

Post menopause, exercise remains essential for maintaining overall health and well-being. Higher physical activity levels of any type may reduce menopausal symptoms but the most important types of exercise to focus on during this life stage are those that address specific health concerns and help mitigate the physical changes that can occur after menopause. Women tend to present a more rapid decline in physical fitness than men in middle age and the level of physical activity declines as age progresses. Physical activity is defined as a behavior that involves human movement, resulting in physiological attributes including increased energy expenditure and improved physical fitness. Here are some key types of exercise that are particularly important post menopause:

- **Strength Training (Resistance Exercises):**
  - Strength training exercises, such as lifting weights or using resistance bands, are crucial for preserving muscle mass and bone density, both of which tend to decline with age. Strength training can help prevent or manage conditions like sarcopenia (muscle loss) and osteoporosis (bone loss), which postmenopausal women are at an increased risk of developing.
- **Weight-Bearing Cardiovascular Exercise:**
  - Weight-bearing aerobic exercises, such as brisk walking, jogging, dancing, and hiking, help maintain cardiovascular health and bone density. These exercises promote heart health, strengthen bones, and assist in weight management. Research shows that exercise with some sort of impact is the most beneficial to prevent the onset of osteoporosis.
- **Flexibility and Stretching:**
  - Stretching exercises can improve flexibility and joint mobility, which may be particularly beneficial as women age. Maintaining flexibility can help reduce the risk of injuries and support overall mobility and comfort. Chronic anxiety, stress or fear during this transition of life leads to tense muscles, making yoga or other stretch classes beneficial.
- **Balance and Coordination Training:**
  - Balance and coordination exercises, such as yoga, tai chi, and Pilates, are important for reducing the risk of falls and fractures, which can be more common in postmenopausal women due to changes in bone density and muscle mass. There are seven easy steps to incorporate balance training into current programming:
    - Include functional movements with a change in the base of support.
    - Add a balance component of single leg stances.
    - Narrow a current base of support.
    - Decrease surface stability with equipment such as balance pods or the BOSU.
    - Disrupt the center of gravity with transverse movements.
    - Incorporate sensory challenges such as closing the eyes.
    - Add static balance challenges between resistance sets.
- **Core Strengthening:**
  - Core-strengthening exercises help maintain a strong and stable core, which is essential for good posture, preventing lower back pain, and supporting balance and coordination.
- **Pelvic Floor Exercises:**

- Pelvic floor exercises can help improve pelvic floor muscle strength and prevent or alleviate issues like urinary incontinence, which can become more common after menopause. A decline in estrogen weakens the tissues of the vagina and urinary tract. Less estrogen also means less blood flow, as estrogen increases the pliability of the blood vessels, which weakens the tissues even further.
- **Mind-Body Exercises:**
  - Mind-body practices like yoga and tai chi not only improve flexibility and balance but also promote relaxation and stress reduction, which can be especially important for postmenopausal women dealing with mood changes and stress.
- **Aerobic Conditioning:**
  - Regular aerobic exercise, such as swimming, cycling, or dancing, helps improve cardiovascular fitness, boosts mood, and supports weight management. It can also have a positive impact on cognitive function. Cardiovascular exercise or endurance training has been shown to have the greatest effect on decreasing visceral fat storage. Visceral fat is the fat surrounding vital organs deep within the abdominal cavity and entering our coronary arteries (the arteries that feed the actual heart muscle). This type of fat is associated with several health risks, including an increased risk of heart disease, type 2 diabetes, and metabolic syndrome. Here's how cardiovascular endurance exercise affects visceral fat compared to superficial (subcutaneous) fat:
    - **Caloric Expenditure:** Cardiovascular endurance exercise helps burn calories and creates an energy deficit in the body. When you expend more calories than you consume, the body begins to tap into its fat stores for energy, including visceral fat.
    - **Reduced Fat Accumulation:** Regular aerobic exercise can help prevent the accumulation of visceral fat. It is particularly effective at reducing the risk of central obesity, where fat accumulates around the waist and abdominal area.
    - **Metabolic Improvements:** Cardiovascular exercise enhances insulin sensitivity, which can help regulate blood sugar levels. Improved insulin sensitivity is associated with reduced visceral fat accumulation and a lower risk of metabolic disorders.
    - **Hormonal Changes:** Exercise can lead to hormonal changes, including an increase in certain hormones that promote fat breakdown, such as adrenaline and norepinephrine. These hormonal shifts can target visceral fat stores.
    - **Decreased Inflammation:** Visceral fat is metabolically active and produces inflammatory substances. Regular exercise can reduce inflammation in the body, which can contribute to the reduction of visceral fat.
    - **Metabolic Improvements:** Cardiovascular exercise enhances insulin sensitivity, which can help regulate blood sugar levels. Improved insulin sensitivity is associated with reduced visceral fat accumulation and a lower risk of metabolic disorders.
    - **Hormonal Changes:** Exercise can lead to hormonal changes, including an increase in certain hormones that promote fat breakdown, such as adrenaline and norepinephrine. These hormonal shifts can target visceral fat stores.
    - **Decreased Inflammation:** Visceral fat is metabolically active and produces inflammatory substances. Regular exercise can reduce inflammation in the body, which can contribute to the reduction of visceral fat.

The ideal exercise routine post menopause should be well-rounded and tailored to individual needs and preferences. It's essential to create a personalized exercise plan that considers any specific health concerns or limitations. Additionally, remember to start gradually, listen to your body, and prioritize consistency over intensity. It is important to incorporate the fitness principles of individuality, progressive overload, diminishing returns, and periodization.

Periodization, a structured combination of strength training, weight-bearing cardiovascular exercise, flexibility work, and stress-reducing practices can help postmenopausal women maintain a high level of physical function, prevent age-related health issues, and enhance the overall quality of life.

## ***PERIODIZATION WHEN PROGRAMMING FOR MENOPAUSAL WOMEN***

Periodization or variation is a fitness principle, when used correctly, that helps prevent overtraining which results in chronically high levels of cortisol which lowers the body's immunity. Periodization, otherwise known as variation, is the planned manipulation of training variables (such as load, sets and reps or frequency, intensity, and duration of cardiorespiratory work) in order to maximize training adaptations. This variation can be traditional, undulating, linear, or block periodization. Traditional periodization is most often used when an athlete has a competition that occurs once or twice a year while block periodization is used to maximize training adaptations throughout the year. We will be concentrating on block, linear and undulating periodization, which is geared towards specific training goals in blocks ranging from 2-4 weeks in an effort to acutely overload the body's systems without overtraining. Each block focuses on a minimal number of desired outcomes and targeted abilities.

Overtraining is best avoided by creating block periodization that concentrates on rotating intensity, duration, and overload. As the body begins to change with menopause, women tend to increase all three of the previous variables simultaneously which results in an increase in cortisol due to overtraining. Moderate physical activity is defined as an average effort with a slight increase in breathing rate and may be performed during different daily activities. Vigorous activity is a hard effort with an increased heart and breathing rate. To avoid overtraining, post menopausal women should aim for 3 or more days of vigorous activity of 20 minutes or 5 or more days of moderate intensity activities.

All programming should start with medical clearance (PAR-Q) at minimum and a basic screening of choice. Many trainers begin with a FUNCTIONAL MOVEMENT SCREENING (FMS) to determine any mobility issues. Others may incorporate any upper body strength test, a muscular endurance test, a flexibility screening, a cardiovascular endurance test or a combination of the above. Following possible menopausal weight gain, many women are concerned about body composition so a bioelectrical impedance analysis (BIA) is often performed. If you do not have access to BIA, skinfold calipers, or a circumference panel may be assessed. A simple Body Mass Index (BMI) evaluation is also an option.

If a woman's weight may have negative effects on her health (overweight = BMI 25.0-29.9; obese = BMI >30), a structured plan needs to be programmed for activity and proper nutrition. A simple online Harris-Benedict calculator will give a very rough estimate of the caloric needs of any individual.

<https://www.omnicalculator.com/health/bmr-harris-benedict-equation#what-is-a-bmr-calculator>

Once you have determined the caloric needs to maintain body mass, it is important to create a caloric deficit of 300-500 calories per day, either by decreased caloric intake or by increased physical activity. There are 3500 calories per pound of body weight so creating a deficit of 300-500 calories per day should create a weight loss of one pound per week or approximately every ten days. If your client prefers a less rigid calculation, it takes about 10 calories to maintain a pound of weight. If the goal weight is 180 pounds, caloric intake should be 1800 calories. Be sure to include any caloric deficits occurred by exercise. Consistency is key in both the nutritional plan and the physical activity.

# PROGRAMMING

Linear periodization, similar to block periodization, begins with high volume (time under tension) and low intensity, and gradually progresses to lower volume and high intensity. An example of linear periodization is adding weight (load) to a given exercise each training period until that block or is completed. Weekly undulating periodization progresses from high volume and low intensity to low volume and high intensity over periods of several weeks or mesocycles. An example of undulating periodization would be doing high volume/ low intensity sessions for a week followed by low-volume/ high intensity sessions the following week.

Periodization can apply to strength or endurance work and entails separating the volume and intensity elements based on the individuals goals.

An example of a weight training protocol of each type might look like this:

SAMPLE EXERCISES TO BE INCLUDED FOR EACH TYPE:

Monday – squat, countermovement jumps, bench press, military press and leg curl.

Wednesday – dead lift, prone barbell row, latissimus dorsi pull-down, preacher curl.

Friday-sumo squats, leg extension, decline bench press, tricep kickbacks and a low row.

**Linear or block periodization** would use two-five week cycles. The first will focus on hypertrophy using 5 sets of each exercise with a one minute rest in between sets. Intensity may range between 75% - 65% of one RM. The second cycle of 5 weeks targets strength with 5 sets and a longer rest of 2-3 minutes between sets because the intensity now ranges from 95%-85% of one RM.

**Undulating periodization** would also use two five-week cycles. The first week of each cycle focuses on hypertrophy with 75%-65% of one RM. The second week in each cycle has a slight decrease in intensity and also repetitions. The final weeks then increase the intensity to 95%-85% intensity with lower reps, focusing on maximal strength.



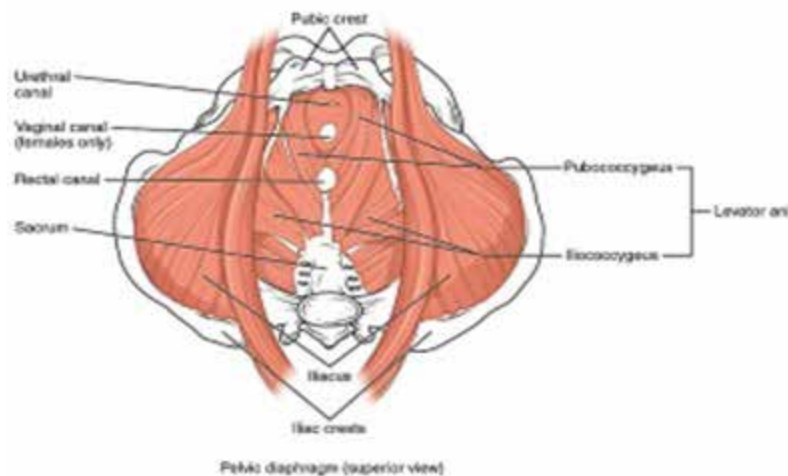
# Chapter 7

## Training the Pelvic Floor Following Menopause

Pelvic floor issues are reported by 25% of females over age 20 and are expected to increase by over 35% over the next two decades. As women age, a decline in estrogen weakens the tissues of the vagina and the urinary tract. Less estrogen, less blood flow and lubrication weakens the muscles of the pelvic floor even more. High impact activities such as running weakens the pelvic floor, and, on the other hand, sedentary muscles receive even less blood flow. Sprawling in a chair for long hours puts pressure on the tailbone which weakens the pelvic floor muscles also.

The pelvic floor, funnel shaped, is a hammock-like structure at the base of the pelvis and it stretches from the anterior pubic bone to the posterior tailbone and from one ischial tuberosity (sit bone) to other from side to side. It surrounds all the openings, forms the base of the core and

1. Support of abdominopelvic viscera through tonic contraction
2. Resistance to increased pressure or stress during coughing, sneezing, heavy lifting, etc.
3. Urinary and fecal continence due to sphincter contraction and relaxation



Pelvic floor dysfunction refers to a range of signs and symptoms that relate to abdominal functioning of the pelvic floor muscles. The pelvic floor muscles are normally firm and thick but not tight and restricted in movement. Hypertonic, or restricted mobility, pelvic floors may be caused by scar tissue from childbirth, pain from hemorrhoids or periods, constant squeezing of the glutes and abdominals during weight training, snug pants or constantly contracting the lower torso. The muscles become contracted constantly which compromises elasticity and flexibility of the pelvic floor as any chronic high-tension state isn't getting oxygenated blood or moving through a full range of motion. Chronic anxiety, stress or fear leads to tense muscles. On the other hand, a hypotonic pelvic floor results in a loss of structural support due to multiple factors such as age, trauma, obesity, and hormonal changes.

This is typically where the incorporation of Kegel exercises is presented in an effort to tighten the structurally unsound muscles. However, Kegels are often done incorrectly and are only a start to improving a hypotonic pelvic floor.

Kegel exercises were named after the physician initially developing and then incorporating these exercises into the therapy for a hypotonic pelvic floor. Done correctly, it is a tightening and relaxing of the superficial and deep pelvic floor muscles. To verbally instruct a proper Kegel contraction, the following steps should include a focus on breathing and muscular contraction;

- Sit on a marble and on exhalation
- Tighten the pelvic floor muscles over the marble
- Lift the marble
- Inhale on release
- Repeat

When learning to properly perform a Kegel, it is important to focus on the pelvic floor and avoid contracting the larger, stronger muscles such as the glutes, chest, abs, quads and hamstrings. Although those muscles need to be targeted for a stronger pelvic floor, they are not a focus in Kegel work.

At rest the pelvic floor maintains a cup-like shape resembling that of the diaphragm. On contraction the pelvic floor ascends towards the pubic and on relaxation, it moves towards the sacral bone with movement of about 3 cm. When the pelvic floor contracts, the internal organs ascend and with contraction and relaxation, pressure change allowing the organs to function correctly. For this reason, proper diaphragmatic breathing plays a major role in the function of the pelvic floor.

Another important function of the pelvic floor is a postural one, again together, with the respiratory diaphragm and abdominal muscles. Muscles of the core that rotate the spinal core must be activated to stand up, sit down or twist. They are also needed to simply stay in a proper standing position or to sneeze or to cough. Specifically, all the abdominal muscles, the pelvic floor and the glutes need to be trained for proper functioning during activities of daily life when involving the pelvic girdle. Pelvic floor contractions also allow the distribution of loads from the trunk and upper limbs to the lower limbs and vice versa during walking and standing. The muscular tension of the pelvic floor also affects proper stance and gait movements. Remember, the body is connected from top to bottom through fascial lines and the body needs to be trained as a whole and not in separate parts. When movement starts in one area of the body, it expands to all parts of the body due to the fascial connections. The fascia is a mechanical force transmission similar to a spider's web holding everything together. An example would be when cervical flexion of the neck joint affects the lower limbs by dragging connective tissue and resulting in lower back pain. The fascial lines give the muscles shape and comprising the biggest organ in the body.

Once the pelvic floor muscles have been located and exercises are performed on a consistent basis, the pelvic floor muscles will be strong enough to prevent urine leakage, decrease the urge to pass urine and decrease the risk of incontinence or stress incontinence as aging occurs. Stressing, straining or forcing to urinate is not healthy for the pelvic floor and as aging, women tend to take advantage of every restroom that is available. A normal urination schedule is 3-4 hours, and of course, shorter with caffeine and longer with states of dehydration. There are normal daily fluctuations in water variations called euhydration so this is an estimation or approximation of average time between restroom visits.



Another possible issue with pelvic floor dysfunction and aging is the prolapse of pelvic organs and constipation.

Sample exercises for the pelvic floor:

- core engaged snow angels
- seated table top ball v-ups with shoulder extensions
- seated figure 8 ball toe taps
- hamstring work in down dog
- leg lifts in supine hip bridge with feet on ball or block
- leg swings in elevated bridge
- hollow holds with block breathing
- prone airplane holding ball or rotating ball

Although the focus after menopause would appear to be the actual muscles of the pelvic floor, it is just as important to add training for the surrounding muscles. Fascia connects the pelvic floor to the surrounding muscles of the core including the glutes, quads, hamstrings, transverse abdominus, the obliques and the erector spinae.

Overall, proper diaphragmatic breathing techniques, training the entire body with functional movements will aid in keep the pelvic floor healthy. In extreme cases of stress incontinence or other hypertonic or hypertonic musculature, seek out a licensed healthcare worker, such as a physical therapist, who specializes in pelvic floor function.



# Chapter 8

## Medical Interventions

There are various medical interventions and treatments available to help women manage the symptoms and challenges associated with menopause. The choice of intervention depends on individual symptoms, preferences, and medical history. It's important to consult with a healthcare provider to determine the most suitable approach. The safety of HRT depends on individual factors, such as a woman's medical history, age and the type and duration of hormone therapy used. Here are some common medical interventions for menopause:

### 1. Hormone Replacement Therapy (HRT):

- HRT involves taking medications that contain hormones, typically estrogen and progesterone, to alleviate menopausal symptoms. There are different types of HRT:
  - **Estrogen-Only Therapy:** Used for women who have had a hysterectomy (removal of the uterus). It can help with symptoms like hot flashes and vaginal dryness.
  - **Combination Therapy:** Combines estrogen and progesterone and is prescribed for women with an intact uterus to reduce the risk of uterine cancer. The type and dosage of hormones will vary.
  - **Low-Dose HRT:** Lower-dose formulations for the shortest durations are available to minimize potential risks associated with hormone therapy.
- HRT can effectively manage symptoms like hot flashes, night sweats, vaginal dryness, and mood changes. However, it's not suitable for everyone, and potential risks and benefits should be discussed with a healthcare provider. The timing of HRT initiation is crucial. For some women, starting HRT shortly after the onset of menopause can provide the most benefits in increase the quality of life and possible decrease the risk of cardiovascular disease and osteoporosis.

### 2. Non-Hormonal Medications:

- Certain non-hormonal medications may help manage specific menopausal symptoms:
  - **Selective Serotonin Reuptake Inhibitors (SSRIs) and Serotonin-Norepinephrine Reuptake Inhibitors (SNRIs):** These antidepressants can help relieve hot flashes and mood disturbances.
  - **Gabapentin and Pregabalin:** These anticonvulsant medications may reduce hot flashes and improve sleep.
- 3. **Vaginal Estrogen:** For women experiencing vaginal dryness, pain during intercourse, or urinary symptoms, topical vaginal estrogen creams, tablets, or rings can provide relief. Vaginal estrogen has a lower systemic absorption compared to oral hormone therapy.
- 4. **Bioidentical Hormone Therapy:** Some women opt for bioidentical hormone therapy, which uses hormones that are chemically identical to those naturally produced by the body. These hormones are often compounded and customized for individual patients. However, their safety and efficacy compared to traditional HRT are still a subject of debate and research.
- 5. **Botulinum Toxin (Botox) for Hot Flashes:** In some cases, Botox injections may be considered for the treatment of severe hot flashes, although this is not a common approach.
- 6. **Complementary and Alternative Therapies:** Some women explore complementary therapies like

acupuncture, herbal remedies (e.g., black cohosh, soy, red clover), and lifestyle changes (e.g., dietary modifications, stress reduction techniques) to manage menopausal symptoms. These approaches can vary in effectiveness, and it's essential to consult with a healthcare provider before trying them.

7. **Psychological and Behavioral Therapies:** Cognitive-behavioral therapy (CBT) and mindfulness-based stress reduction (MBSR) can be effective in managing mood changes, anxiety, and sleep disturbances associated with menopause.
8. **Pelvic Floor Physical Therapy:** For women experiencing urinary incontinence or pelvic floor issues, pelvic floor physical therapy can provide exercises and techniques to improve muscle strength and control.

**Osteoporosis Medications:** If postmenopausal women are at risk of osteoporosis or have already been diagnosed with the condition, medications like bisphosphonates or selective estrogen receptor modulators (SERMs) may be prescribed to strengthen bones.

Discussing risk is difficult because what risk means to someone considering HRT is very different from looking at that same risk for a population. If ten million women take HRT but we look at risk in 10,000, what reads as 6 in 10,000 is now 6000 out of those ten million. If that complication happens to you, that risk is now 100%.

### Risks:

- **Breast Cancer:** The use of combination HRT (estrogen and progestin) has been associated with a slightly increased risk of breast cancer. The risk appears to be greater with long-term use. For women aged 50-59, combined therapy is associated with an additional 6-15 breast cancers per 10,000 women per year. Use for more than 5 years is associated with the greatest risk. Older women also have an increased risk.
  - **Cardiovascular Risk:** The relationship between HRT and heart disease is complex. Estrogen therapy started near menopause may have some cardiovascular benefits, but starting it later or using combination therapy might increase cardiovascular risks. Oral estrogen can worsen triglycerides while improving HDL and total cholesterol
  - **Blood Clots:** HRT can increase the risk of blood clots, especially if the woman has other risk factors, such as smoking or a history of clotting disorders. There is also an increased risk with an increased age with HRT.
  - **Stroke:** There is a small increase in the risk of stroke associated with HRT use, 8 per 10,000 women.
  - **Gallbladder Disease;** with oral estrogen the risk of gallbladder disease ranges from 47-58 additional cases per 10,000 women per year.
9. **Monitoring:** Women on HRT should have regular follow-up appointments with their healthcare provider to assess the benefits and risks of continued therapy and to discuss any changes in health or symptoms.
  10. **Alternatives:** Some women may prefer non-hormonal treatments for menopausal symptoms, including non-prescription remedies, lifestyle changes, and non-hormonal medications. These options should be discussed with a healthcare provider.
  11. **Shared Decision-Making:** The decision to use HRT should be made through shared decision-making between the woman and her healthcare provider. This process involves a thorough discussion of individual risks, benefits, and alternatives.

In summary, hormone replacement therapy can be a safe and effective treatment for managing menopausal symptoms when used judiciously and under the guidance of a healthcare provider.

The decision to use HRT should consider individual health factors, the type of HRT, and the specific symptoms being addressed. It's essential for women to have open and informed discussions with their healthcare providers to make the best choices for their health and well-being during and after menopause.

# Bibliography

- Abou-Taleb HA, Fathalla Z, Naguib DM, Fatease AA, Abdelkader H. Chitosan/Solid-Lipid Nanoparticles Hybrid Gels for Vaginal Delivery of Estradiol for Management of Vaginal Menopausal Symptoms. *Pharmaceuticals (Basel)*. 2023 Sep 11;16(9):1284. doi: 10.3390/ph16091284. PMID: 37765092.
- Alabadi B, Civera M, De la Rosa A, Martinez-Hervas S, Gomez-Cabrera MC, Real JT. Low Muscle Mass Is Associated with Poorer Glycemic Control and Higher Oxidative Stress in Older Patients with Type 2 Diabetes. *Nutrients*. 2023 Jul 17;15(14):3167. doi: 10.3390/nu15143167. PMID: 37513585
- American College of Obstetricians and Gynecologists. Practice Bulletin No. 141: Management of menopausal symptoms. *Obstetrics & Gynecology*. 2014; doi:10.1097/01.AOG.0000441353.20693.78.
- Bachmann G, et al. Treatment of genitourinary syndrome of menopause (vulvovaginal atrophy). <https://www.uptodate.com/contents/search>.
- Casper RF. Clinical manifestations and diagnosis of menopause. <https://www.uptodate.com/contents/search>. *Cell Res Ther*. 2023 Jun 20;14(1):165. doi: 10.1186/s13287-023-03397-2. PMID: 37340468 Free PMC article.
- Cheng G, Wang M, Sun H, Lai J, Feng Y, Liu H, Shang Y, Zhao Y, Zuo B, Lu Y. Age at menopause is inversely related to the prevalence of common gynecologic cancers: a study based on NHANES. *Front Endocrinol (Lausanne)*. 2023 Nov 16;14:1218045. doi: 10.3389/fendo.2023.1218045. eCollection 2023. PMID: 38034008
- Cobin RH, Goodman NF; American Association of Clinical Endocrinologists and American College of Endocrinology Position Statement on Menopause -2017 Update. AACE Reproductive Endocrinology Scientific Committee. *Endocr Pract*. 2017 Jul;23(7):869-880. doi: 10.4158/EP171828.PS. PMID: 28703650
- Crandall CJ, Mehta JM, Manson JE. Management of Menopausal Symptoms: A Review *JAMA*. 2023 Feb 7;329(5):405-420. doi: 10.1001/jama.2022.24140. PMID: 36749328
- David PS, Sobel T, Sahni S, J Mehta J, Kling, JM - FDA approves novel drug to treat moderate to severe hot flashes caused by menopause. *Drugs & Aging*, 2023.
- Faubion SS, Enders F, Hedges MS, Chaudhry R. Impact of menopause symptoms on women in the workplace, Mayo Clinic, 2023.
- Frequently asked questions: Women's Health FAQ047. The menopause years. American College of Obstetricians and Gynecologists. <https://www.acog.org/patient-resources/faqs/womens-health/the-menopause-years>.
- Genazzani AR, Monteleone P, Giannini A, Simoncini T. Symptoms of Menopause-global prevalence, physiology and implications. *Reprod Update*. 2021 Oct 18;27(6):1115-1150. doi: 10.1093/humupd/dmab026. PMID: 34432008 Clinical Trial.
- Gottfried, Sara. *The Hormone Cure*. Scriber, NY 2013.
- Gottfried, Sara. *Women, Food and Hormones*. Houghton Mifflin Harcourt, NY, 2021
- Gunter, Jen. *The Menopause Manifesto*. Citadel Press, NY. 2021
- Hassan et al, Neurokinin 1/3 receptor antagonists for menopausal women: A current systematic review and insights into the investigational non-hormonal therapy. *Medicine (Baltimore)*. 2023 Jun 9;102(23): 33978. doi: 10.1097/MD.00000000000033978. PMID: 37335635
- Heart disease facts. CDC and Prevention, <https://www.cdc.gov/heartdisease/facts.htm>.
- Huntriss et al. Epigenetics and reproductive medicine. 2018 Scientific Advisory Committee of the Royal College of Obstetrics and Gynecology.
- Inaraja et al. Lipid Profile Changes during the Menopausal Transition. *Menopause*, 2020.
- Isidori et al. ACTH and a-MSH inhibit leptin expression and secretion. *Molecular and Cellular Endocrinology*; 200; 2003.

- Jameson JL, et al, eds. Menopause and postmenopausal hormone therapy. Harrison's Principles of Internal Medicine. 20th edition, McGraw Hill 2018
- Ji J, Hou Y, Li Z, Zhou Y, Xue H, Wen T, Yang T, Xue L, Tu Y, Ma T. J Association between physical activity and bone mineral density in postmenopausal women: a cross-sectional study from the NHANES 2007–2018. Orthop Surg Res. 2023 Jul 15;18(1):501. doi: 10.1186/s13018-023-03976-2. PMID: 37454096 Free PMC article.
- Kenny and Costill, Physiology of Sport and Exercise, 7th edition, Human Kinetics, IL. 2020
- Manson JE, Bassuk SS, Vitamin and mineral supplements. What clinicians need to know, Journal of the American Medical Association, 2018, 319.
- Menopausal symptoms: In depth. National Center for Complementary and Integrative Health. <https://www.nccih.nih.gov/health/menopausal-symptoms-in-depth>.
- Menopause and your health. Office on Women's Health. <https://www.womenshealth.gov/menopause/menopause-and-your-health>.
- Menopause symptoms and relief. Office on Women's Health. <https://www.womenshealth.gov/menopause/menopause-symptoms-and-relief>.
- Mumford SL, Chavarro JE, Zhang C. Dietary fat intake and reproductive hormone concentration and ovulation in regularly menstruating women. American Journal of Clinical Nutrition, 2016.
- North American Menopause Society. Nonhormonal management of menopause-associated vasomotor symptoms: 2015 position statement of The North American Menopause Society. Menopause. 2015; doi:10.1097/GME.0000000000000546.
- North American Menopause Society. The 2017 hormone therapy position statement of The North American Menopause Society. Menopause. 2017; doi:10.1097/GME.0000000000000921.
- Olson, Amanda. Restoring the Pelvic Floor for Women. 2018
- Park P, Lee J. ERα associated translocations underlie oncogene amplifications in breast cancer, Nature, May 17, 2023.
- Santen RJ, et al. Menopausal hot flashes. <https://www.uptodate.com/contents/search>.
- Vaginal dryness. The North American Menopause Society. <http://www.menopause.org/publications/consumer-publications/-i-menonotes-i>.
- Welt CK, et al. Ovarian development and failure (menopause) in Sept. 8, 2020.
- Welt CK. Clinical manifestations and diagnosis of spontaneous primary ovarian insufficiency (premature ovarian failure). <https://www.uptodate.com/contents/search>.
- Welt CK. Pathogenesis and causes of spontaneous primary ovarian insufficiency (premature ovarian failure). <https://www.uptodate.com/contents/search>.
- Yoga, Kegel exercises, pelvic floor physical therapy. North American Menopause Society. <https://www.menopause.org/for-women/sexual-health-menopause-online/effective-treatments-for-sexual-problems/yoga-kegel-exercises-pelvic-floor-physical-therapy>.



# EXAM INSTRUCTIONS

## Exam Instructions

After you complete the course, you will be ready to take the exam. Please follow these simple instructions:

1. To take your exam click on the following link: [www.scwfit.com/menopauseexam](http://www.scwfit.com/menopauseexam)
2. After you click on the link above, you will be asked to create a log-in and password to access your exam, results, and certificate.
3. Keep your log-in and password in a safe place and do not lose it.
4. Begin your exam.
5. There is no time limit for the exam - you can even start and stop your exam with the ability to resume later. The exam will be available for 60 days after the date of your purchase.
6. You must obtain a score of 70% or greater to pass. You have two attempts to pass the exam.
7. Once you pass your exam, you can print your customized certificate by clicking on the certificate link on the bottom right-hand corner of the page.

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