

# IS WEIGHT GAIN DURING MENOPAUSE INEVITABLE?



Pietra Fitness Continuing Education

## 0.5 CEC

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As a health and exercise professional, you will undoubtedly encounter female clients who are experiencing menopause. Menopause means the permanent “pause” of menses, which indicates the end of a woman’s ability to bear children, and is a series of overlapping stages that may take years through which to progress (Table 1). The [World Health Organization](#) estimates that by the year 2025, 1.1 billion women will be age 50 years or over, all of whom will be, or soon to be, experiencing menopause.

Typically, menopause is a natural and steady process in which the ovaries reduce their production of the female sex hormones estrogen, progesterone and testosterone. These hormones allow a woman to become pregnant and menstruate, but they affect many other functions in the body as well, including the circulatory, urogenital (urinary and vaginal) and the skeletal systems. When the production of these hormones declines, menopausal symptoms such as weight gain may occur.

Fluctuations in reproductive hormone concentrations during a woman’s life predisposes her to excess weight gain (Table 2). During the perimenopausal stage, most women gain about 5 pounds (Wing et al., 1991); however, some women may experience a more significant weight gain. While weight gain seems to be common, it is the shift toward abdominal fat distribution that raises concerns. Research has found that post-menopausal women have greater central or android fat distribution, as well as greater visceral abdominal adipose tissue compared to pre-menopausal women (Wang et al., 1994).

### **Hormonal Changes and Weight Gain**

Weight gain is caused by an energy imbalance in which intake exceeds expenditure. For example, Lovejoy et al. (2008) found that over a four-year period women who transitioned from pre- to post-menopausal status experienced declines in energy expenditure of approximately 200 kcals per day. In other words, as women progress through menopause, they may become less active, which can lead to weight gain. However, declines in energy expenditure alone does not explain the increase in central adiposity, as hormones also play a role.

Estrogen is a key regulator of growth and differentiation (the process by which cells change from relatively generalized to specialized) in a wide range of tissues, including the reproductive system, mammary glands and the central nervous system. Estrogen is linked to metabolism, in which the hormone has been known to play an important role in regulating adipose development and deposition in females (Cooke and Naaz,

2004). Estrogen has also been shown to reduce food intake through actions on the hypothalamus (Geary et al., 2001; Wade et al, 1985), which means that as estrogen declines, food intake tends to increase. Leptin, a hormone that is involved in energy intake and expenditure, may also be regulated by estrogen (Cooke and Naaz, 2004). As estrogen declines, leptin increases, which, in turn, signals a need to increase food intake. Studies also show that estrogen deficiency is related to a preferential increase in visceral fat (Carr, 2003; Poehlman et al., 1995).

### The Role of Estrogen Receptors

Discovery of estrogen’s effects on the body as a regulator of energy expenditure, appetite and body weight has stimulated deeper investigation into the role of estrogen receptors. Recent research has focused on estrogen receptor- $\alpha$  (ER $\alpha$ ), which is found in the hypothalamus. In animal studies, the impact of obesity has been shown to be mediated primarily through ER $\alpha$ . The disruption of ER $\alpha$  in the hypothalamus, where researchers remove the receptors from the

brain of mice, leads to weight gain, increased visceral adiposity, hyperplasia, hyperglycemia and impaired energy expenditure (Xu et al., 2011; Ribas et al., 2010). While these studies focus on mice, the implications to human physiology are quite strong. Further research is ongoing in this area and proves to be an exciting possibility for strategies and treatments for women to prevent weight gain and central adiposity during menopause.

**Table 1: Definitions of Menopausal Stages**

<b>Premenopause</b>	Includes the entire reproductive period up to the final menstrual cycle. It is defined as a time of “normal” reproductive function. on balls of feet.
<b>Perimenopause</b>	Includes the time immediately prior to menopause and the first year after menopause. This is the time when a woman’s body slowly makes less estrogen and progesterone, resulting in menopause symptoms. The onset is typically between 45 and 60 years of age and can span a two- to six-year period.
<b>Menopause</b>	Permanent cessation of menstruation and fertility resulting from the loss of ovarian follicular activity. This stage can only be confirmed a year or more after the final menstrual cycle.
<b>Post-menopause</b>	Permanent cessation of menstruation and fertility resulting from the loss of ovarian follicular activity. This stage can only be confirmed a year or more after the final menstrual cycle.
<b>Post-menopause</b>	Period of life after the final menstrual period

### Weight Gain is Not Inevitable

Although estrogen is capable of producing effects on adipose tissue by acting indirectly through other tissues that regulate appetite, energy expenditure or metabolism, this does not mean that weight gain is inevitable. Exercise studies show that weight gain and especially visceral fat deposition can be lessened in menopausal women. Walking, high-intensity interval training (HIIT) and multi-component (cardiorespiratory, strength and flexibility) exercise programs can all produce favorable results related to improvement in body composition (Maillard et al, 2016; Aragão et al., 2014; Irwin et al., 2003). While it may be challenging for your clients who are experiencing menopausal weight gain,

**Table 2: Hormones of Interest**

<b>Hormone</b>	<b>Purpose</b>	<b>Menopausal Change</b>	<b>Outcome</b>
<b>Estrogen</b>	Responsible for causing monthly ovulation	↓	Includes the entire reproductive period up to the final menstrual cycle. It is defined as a time of “normal” reproductive function. As the ovaries produce less estrogen, the body relies on other sources
<b>Progesterone</b>	Prepares the uterus for egg implantation, maintains pregnancy and prevents further ovulation during pregnancy	↓	This decrease in progesterone can be associated with an increased extracellular fluid retention, also known as bloating
<b>Testosterone</b>	Anabolic effects include growth of muscle mass and strength, as well as increased bone density	↓	The loss of testosterone can contribute to declines in fat-free mass, bone density and increased risk of heart disease

it is not a losing battle. With your guidance, weight loss can occur during this time of transition.

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# IS WEIGHT GAIN DURING MENOPAUSE INEVITABLE?

## 0.5 CECs Physical

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. True or False Menopause indicates the end of woman's ability to bear children, and is a series of overlapping stages that takes a few months through which to progress.
  - 2.
  
2. The female sex hormones that decline in production in the ovaries include: \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_.
  
3. True or False The female sex hormones are responsible only for a woman's fertility.
  
4. Which type of fat distribution tends to increase and raises concerns during menopause:
  - a. hips and thighs
  - b. hamstring and gluteal
  - c. visceral abdominal
  - d. medial back
  
4. Weight gain is caused by an energy imbalance in which expenditure (exceeds or lags behind) intake.
  
6. True or False Fat deposited in the mid-section is a result of lower energy levels and hormone changes.
  
7. Estrogen is linked to \_\_\_\_\_.

Name: \_\_\_\_\_ Date: \_\_\_\_\_

8. What area of the body is connected to the hormone, leptin, which signals a need to increase food intake?

- a. olfactory sense
- b. brain
- c. optic nerve
- d. taste receptors

9. A change in \_\_\_\_\_, which is found in the hypothalamus, has been shown in rats to cause weight gain.

10. True or False Is it possible to lose weight during menopause?