

The Importance of Natural Hormone Replacement in Women

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Hormonal balance in a woman's body is a key component of her overall health. All of the hormones in a woman's body interact with each other. They are a web, a symphony that must play in tune for her to feel great and be healthy. A woman can have hormonal dysfunction at any age. This article will focus on estrogen, progesterone, and testosterone in perimenopausal and menopausal women.

Estrogen in a woman is produced in the ovaries, and the body has receptor sites for estrogen in many locations: brain, muscles, bone, bladder, gastrointestinal tract, uterus, ovaries, vagina, breasts, eyes, heart, lungs, and blood vessels, to name just a few. A woman's eyes even have estrogen receptors.

Estrogen has over 400 functions in a woman's body. Some of the functions of estrogen:

- acts as a natural calcium channel blocker to keep the arteries open
- aids in the formation of neurotransmitters in the brain, such as serotonin
- decreases LDL and helps prevent oxidation
- lowers lipoprotein A
- decreases the accumulation of plaque on the arteries
- decreases wrinkles
- decreases the risk of developing colon cancer
- dilates small arteries
- enhances magnesium uptake and utilization
- enhances the production of nerve growth factor
- helps maintain the elasticity of the arteries
- helps maintain memory
- helps prevent tooth loss
- helps with fine motor skills
- improves insulin sensitivity
- increases blood flow
- increases concentration
- increases HDL by 10% to 15%
- increases reasoning skills
- elevates the water content of the skin, which is responsible for its thickness and softness
- increases metabolic rate, which helps the body run at a youthful level
- inhibits platelet stickiness
- maintains bone density
- supports the amount of collagen in the skin
- benefits vision by helping to prevent macular degeneration
- reduces homocysteine
- reduces overall risk of heart disease by 40% to 50%
- reduces vascular proliferation and inflammation
- decreases the risk of cataract development
- arthritis
- brittle hair and nails
- chronic fatigue
- cognitive decline
- decrease in breast size
- diminution in dexterity
- decreased sexual interest and function
- depression
- diabetes
- difficulty losing weight, even with diet and exercise
- dry eyes
- elevated risk of developing insulin resistance and diabetes
- food cravings
- hypercholesterolemia
- hypertension
- increase in facial hair
- increased risk of developing coronary heart disease and cerebral vascular accidents
- increase in tension headaches
- infertility
- joint pain
- more wrinkles
- oily skin
- osteopenia or osteoporosis
- panic attacks
- restless sleep
- stress incontinence
- thinning hair
- urinary tract infections
- vaginal dryness
- vulvodynia
- weight gain

Since estrogen is responsible for so many functions in a woman's body, she may have many symptoms as her estrogen levels start to decline. Symptoms and signs of estrogen deficiency:

- acne
- anxiety

Many women who suffer estrogen-related problems are either estrogen deficient or estrogen dominant.

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Estrogen dominance can result from the overproduction of estrogen by the body or an imbalance between estrogen and progesterone where levels of estrogen are normal or high and levels of progesterone are suboptimal. Symptoms and signs of estrogen dominance:

- bloating
- cervical dysplasia
- decreased sexual interest
- depression with anxiety or agitation
- elevated risk of developing breast cancer
- fatigue
- fibrocystic breast disease
- headaches
- heavy menstrual cycles
- hypothyroidism (increases the binding of thyroid hormone which can cause low thyroid levels)
- increased risk of developing autoimmune diseases
- increased risk of developing uterine cancer
- irritability
- mood swings
- panic attacks
- poor sleep
- swollen breasts
- uterine fibroids
- water retention
- weight gain, especially in the abdomen, hips, and thighs

There are several etiologies for estrogen dominance: a diet low in grains and fiber, elevation of 16-OH estrone, environmental estrogens, lack of exercise, impaired elimination of estrogen, and the patient taking too much estrogen.

A woman's body makes three different kinds of estrogen: estrone (E1), estradiol (E2), and estriol (E3). Estrone is the main estrogen that a woman produces postmenopausally. It is derived from estradiol. High levels of E1 stimulate breast and uterine tissue, and many researchers believe that this increases a woman's risk of developing cancer.

Estrone is considered a reserve source for estrogen, its only known function. Consequently, if estrogen levels become suboptimal, the body can draw from and use this stored amount.

Before menopause, E1 is made by the ovaries, adrenal glands, liver, and fat cells. It is then converted to E2 by the ovaries. After menopause, little E1 becomes E2, since the ovaries decrease in function and eventually stop working. In later years, E2 is made in the fat cells and, to a lesser degree, in the liver and adrenal glands. Therefore, the more body fat the patient has, the more E1 will be made. Consequently, obese women have an increased E1 to E2 ratio. Also, routine alcohol consumption decreases ovarian hormone levels and increases the levels of E1, which can lead to an increased risk of breast cancer.

Estradiol is the strongest form of estrogen. It is 12 times stronger than estrone and 80 times stronger than estriol. It is the main estrogen the body produces before menopause. Most of the body's E2 is made in the ovaries. High levels of E2 are associated with an increased risk of breast and uterine cancer. Estradiol is the form of estrogen that declines at menopause. However, two-thirds of postmenopausal women up to age 80 continue to produce some E2.

Estriol has a much lesser stimulatory effect on the breast and uterine lining than E1 or E2. E3 does not promote breast cancer risk, most scientists believe. In fact, evidence now exists to show that E3 helps protect against breast cancer. In other countries, E3 has been used for this purpose for over 60 years.

One of the wonderful things about E3 is that it is an adaptogen, meaning that it adapts to the specific environment of the body it is in. When given by itself, E3 does exert strong estrogenic effects. When given in a 10-fold amount in relationship to E2, E3 antagonizes the effects of E2,

which may also be another reason that E3 helps decrease the risk of breast cancer.

Studies over the last 30 years have revealed that E3 given experimentally to women with breast cancer has decreased a recurrence of the disease. This includes one study in the 1970s wherein women with metastatic breast disease were given E3. Of the women, 37% experienced a remission when treated with estriol. This subject remains controversial and experimental. Certainly more studies need to be done before estriol should be considered for use in nonexperimental situations in women who have had a hormonally related breast cancer.

Estriol, since it is a weaker estrogen than E1 or E2, does not have the bone, heart, or brain protection that E2 does. E3 does however, have some positive effects on bone and also heart health by lowering cholesterol. Functions of estriol:

- benefits the vaginal lining
- blocks E1 by occupying the estrogen receptor sites on the breast tissue
- controls symptoms of menopause
- decreases LDL
- helps the gastrointestinal tract maintain a favorable environment for the growth of lactobacilli
- helps restore the proper pH of the vagina, which aids to prevent infections
- increases HDL

The body has two main binding sites for estrogen: estrogen receptor alpha, which increases cell growth, and estrogen receptor beta, which is associated with decreasing cell growth and helping to prevent breast cancer development. E2 equally activates estrogen-receptors alpha and beta. E1 activates estrogen-receptor alpha selectively in a ratio of 5:1, which increases cell proliferation. E3 binds preferentially to estrogen-receptor beta in a 3:1 ratio, which may be one of the reasons that E3 may help prevent breast cancer risk.

Estrogen, as hormone replacement therapy, should be prescribed for

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transdermal use. Estrogen prescribed orally has been shown to have the following side effects:

- causes weight gain
- changes the metabolism of tryptophan and serotonin
- decreases growth hormone levels
- elevates blood pressure
- elevates liver enzymes
- increases CRP levels
- increases the risk of developing gallstones
- increases sex hormone binding globulin (SHBG), which can lower testosterone levels
- increases estrone levels
- increases triglycerides
- increases carbohydrate cravings
- increases prothrombic effects

Estrogen has many protective effects on the brain. Results from several studies have revealed that it helps maintain memory and cognitive function. It also increases a woman's ability to learn new ideas. A Stanford University study showed that women who took estrogen were better able to recall people's names than women who did not take estrogen. Furthermore, a study done at McGill University in Canada found that women taking estrogen had better verbal memory than women who were not on hormone replacement therapy. Likewise, women who are on estrogen are less than half as likely to develop Alzheimer's disease than women who are not on estrogen, according to another clinical trial. Other studies have shown that estrogen use in postmenopausal women may delay the start of Alzheimer's disease. A recent study conducted on 1889 older women (at least 65 years of age) in Utah revealed that the women who had taken hormone replacement therapy were 40% less likely to develop Alzheimer's disease. Also, the longer the women were on hormone replacement therapy, the lower their risk was of developing the disease. Estrogen has many other effects on the brain:

- affects gene expression
- boosts NMDA receptors by 30% to maintain strength and durability of synaptic connections involved in creating long-term memories
- decreases distractibility
- decreases dopamine receptor sensitivity
- decreases the seizure threshold
- enhances transmission of dopamine
- improves the function of the neurons
- increases availability of acetylcholine
- increases availability of serotonin
- increases blood flow
- increases energy, mood, and feeling of well-being
- increases excitability
- increases GABA
- increases glucose and oxygen transportation to the neurons
- increases manual speed and dexterity
- increases norepinephrine effect
- increases sensitivity to nerve growth factor, which stimulates the growth of dendrites and axons in the brain
- increases the production of choline acetyltransferase, which is needed for the production of acetylcholine, the main neurotransmitter of memory
- increases verbal fluency and articulation
- maintains the blood-brain barrier
- protects the neurons
- regulates membrane channels
- turns on progesterone receptors

Progesterone is an important part of the hormonal balance in women and is made in the ovaries until menopause. After menopause, a small amount of progesterone is made in the adrenal glands. Progesterone has several functions in the body:

- balances estrogen
- has a positive effect on sleeping patterns
- helps build bone

- helps prevent anxiety, irritability, and mood swings
- helps bladder function
- relaxes the smooth muscle in the gastrointestinal tract
- is neuroprotective

A woman's progesterone level can be low at any time in her life. Commonly, PMS and postpartum depression are progesterone-deficient states. As a woman approaches perimenopause and menopause, often progesterone is the first hormone to decline. Progesterone levels can be low due to antidepressant use; hypothyroidism; deficiencies of vitamins A, B6, C, and/or zinc; excessive arginine consumption; and high levels of stress. Progesterone levels can also be truncated due to a large intake of sugar or saturated fat. Signs and symptoms of progesterone deficiency:

- anxiety
- low HDL levels
- decreased libido
- depression
- excessive menstruation
- hypersensitivity
- insomnia
- irritability
- menstrual migraines
- mood swings
- nervousness
- osteopenia/osteoporosis
- pain and inflammation
- weight gain

Synthetic progesterone is called *progestin*. It has a very different chemical structure than progesterone does. Consequently, progestins do not reproduce the same actions as progesterone. Progestins do not balance the estrogen in the body. They interfere with the body's production of its own progesterone. Other possible side effects of progestins:

- acne
- bloating
- breakthrough bleeding
- breast tenderness

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- counteracts some of the positive effect estrogen has on serotonin
- decreases energy
- decreases sexual interest
- depression
- elevates LDL
- fluid retention
- hair loss
- headaches
- increases appetite
- insomnia
- irritability
- lowers HDL
- nausea
- protects the uterus but not the breasts from cancer
- rashes
- remains on the receptor sites longer than progesterone
- spasm of the coronary arteries
- weight gain

Both progestins and progesterone have been shown to build bone, help thyroid function, and protect against fibrocystic breast disease.

Natural progesterone means that the progesterone that the patient is taking is the same chemical structure as the progesterone that she was born with. The word *natural* in this context does not necessarily mean that it comes from a plant. The process of producing natural progesterone was discovered by Russell Marker, a Pennsylvania State College chemistry professor. Back in the 1930s, Marker discovered that by using a chemical process, diosgenin (a plant steroid) could be turned into a form of progesterone that is an exact biological duplicate of the progesterone produced by the human body. Natural progesterone, since it is the same chemical structure that the woman makes, has the same effects of progesterone produced by the body. Effects of natural progesterone:

- balances estrogen levels
- decreases the severity and frequency of menstrual migraines
- does not change the positive effects that estrogen has on blood flow

- enhances the action of thyroid hormones
- has a natural calming effect
- balances fluids in the cells
- helps restore proper cell oxygen levels
- helps with sleep hygiene
- helps the body use and eliminate fats
- increases the beneficial effects that estrogen has on blood vessel dilation
- increases metabolic rate
- increases scalp hair
- induces conversion of E1 to the inactive E1S form
- is a natural antidepressant
- is a natural diuretic
- is an anti-inflammatory
- leaves the body quickly
- lowers cholesterol
- lowers blood pressure
- may protect against breast cancer by inhibiting breast tissue overgrowth
- normalizes and improves libido
- promotes a healthy immune system
- promotes myelination and helps protect nerves from injury
- relaxes smooth muscle
- stimulates the production of new bone

Progesterone can be prescribed orally or transdermally. If the patient is suffering from insomnia, then oral use of progesterone is suggested. The pill form affects the GABA receptors in the brain, which has a calming effect upon the patient. Since progesterone has so many functions in a woman's body, it is suggested that progesterone be prescribed even if the woman has had a complete hysterectomy if her levels are deficient.

Because progesterone can be bought in the US without a prescription, some women will purchase progesterone on their own without having lab tests done. Excessive progesterone levels in relationship to estrogen can cause the following signs and symptoms:

- decreases glucose tolerance and increases insulin and cause insulin resistance
- decreases HDL
- elevates cortisol levels
- increases appetite
- increases carbohydrate cravings
- increases fat storage
- increases lipid levels
- increases risk of gallstones
- lowers growth hormone levels
- ligament laxity, which can lead to backaches, leg aches, and achy hips
- relaxes smooth muscles in the gastrointestinal tract, which can lead to bloating, fullness, and constipation
- suppresses the immune system
- urinary incontinence
- weight gain

Consequently, it is important that a patient not take progesterone on her own without seeing a health-care practitioner.

Testosterone is another sex hormone that is very important in a woman's hormonal symphony. Testosterone levels can be too low or high during a woman's lifetime. Testosterone performs many important functions in the body:

- decreases bone deterioration
- decreases excess body fat
- elevates norepinephrine in the brain and thus has an antidepressant effect
- helps maintain memory
- increases muscle mass and strength
- increases muscle tone
- increases sense of emotional well-being, self-confidence, and motivation
- increases sexual interest

Woman can have low testosterone levels due to stress, postchildbirth, endometriosis, menopause (either natural or surgical), psychological trauma, statin drug use, or oral contraceptive use. Oral contraceptives can elevate sex hormone binding globulin, which can lower the level of testosterone that the body has

available for use. Signs and symptoms of testosterone deficiency:

- anxiety
- decline in muscle tone
- decreased HDL
- decreased sex drive
- droopy eyelids
- dry, thin skin with poor elasticity
- dry, thinning hair
- fatigue
- hypersensitive, hyperemotional states
- less dreaming
- loss of pubic hair
- low self-esteem
- mild depression
- muscle wasting despite adequate calorie and protein intake
- saggy cheeks
- thin lips
- weight gain

There are several ways to raise testosterone levels in a woman without a prescription, including: decreasing caloric intake; exercise; improving sleep hygiene; increasing the amount of protein in her diet; weight loss; stress reduction; taking arginine, leucine, or glutamine; and taking zinc if zinc levels are low. Zinc is needed for the metabolism of testosterone.

Natural testosterone (prescription testosterone that is the same chemical structure as the patient's own testosterone) is the preferred method of testosterone replacement. Synthetic testosterone, or methyltestosterone, has been associated with an increased risk in the development of liver cancer. Testosterone is usually prescribed transdermally, since it is less toxic to the liver. It is important that a woman be instructed to rotate sites when she applies the testosterone, or she may grow hair at the site of application.

As with other hormones, a woman can have too much testosterone in relationship to other sex hormones in the body. Overproduction of testosterone can be due to adrenal dysfunction or ovarian dysfunction. A high testosterone level caused by ovarian dysfunction is called polycystic ovarian disease. As women go through menopause, they can also

have high testosterone levels that do not decline with age. Symptoms of excess testosterone production:

- acne or oily skin
- agitation
- anger
- anxiety
- changes in memory
- decreased HDL
- depression
- fatigue
- fluid retention
- hair loss
- hirsutism
- hypoglycemia
- increased insulin resistance
- increased risk of developing breast cancer
- infertility
- irregular menstrual cycles
- mood swings
- salt and sugar cravings
- weight gain

If the patient's testosterone level is elevated, giving the herb saw palmetto can lower it. Also metformin and spironolactone have been shown to lower high testosterone levels in a woman. It is furthermore important

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that testosterone levels balance with estrogen levels in the body. In order for testosterone to work optimally, estradiol levels must be optimized. Without enough estrogen present, testosterone cannot attach to a woman's brain receptors. If testosterone is taken with estrogen, it lowers a woman's cardiac risk if she is deficient in both of these hormones. If estrogen levels are low and testosterone is replaced, it can increase plaque formation in the vessels of the heart.

In summary, it is very important that a woman be hormonally balanced throughout her lifetime. Estrogen, progesterone, and testosterone must exist in a hormonal symphony for women to remain asymptomatic and enjoy optimal health.

Next month we will look further at hormonal balance: DHEA and cortisol.

This article is an excerpt from: Smith P. *What You Must Know About Woman's Hormones*. Garden City Park: Square One Publishers; 2010. References for this article are located in that text.

