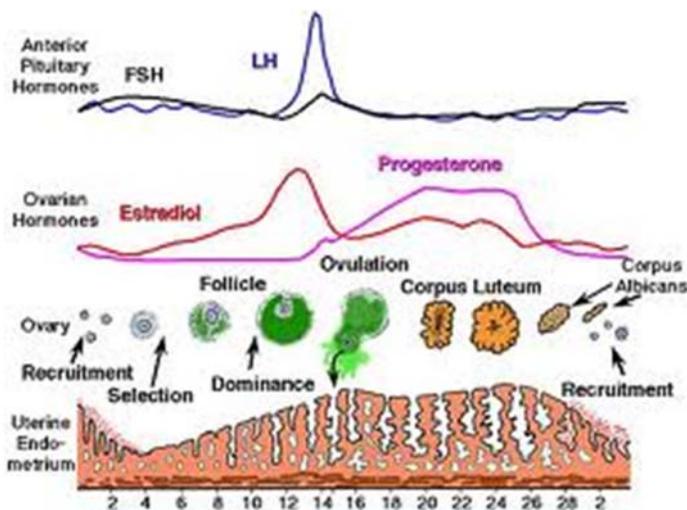


## Bioidentical Hormone Replacement Therapy for Women

### Menstrual Cycle

- Days 1-5: Estrogen falls and FSH rises. Menstrual bleeding occurs and lasts around 5 days. The shedding of the endometrium is a result of a drop in estrogen and progesterone signaling that a pregnancy has not occurred.
- Days 6-14: Estrogen rises and FSH falls. Endometrial lining grows thicker, more FSH is secreted, triggering large and sudden LH release which causes the follicle to release the egg into the fallopian tube. The ruptured follicle is called the corpus luteum.
- Days 14-28: Estrogen and progesterone increase initially and then decrease. The corpus luteum releases large amounts of progesterone to prepare the endometrial lining for implantation of a fertilized egg. If a fertilized egg implants, HCG is released (this is what is detected with pregnancy tests). If there is no implantation, estrogen and progesterone decrease and the lining is shed.



### Perimenopause and Menopause

Menopause is defined as the termination of menstrual periods and it occurs after 12 months with no periods. It also refers to the end of ovarian function and the hormonal deficiencies that follow. The ovaries begin to primarily produce testosterone and androstenedione instead of estrogen and progesterone. The median age of onset in the United States is approximately 51 years. Postmenopausal women are at an increased risk for cardiovascular disease, including, high blood pressure, heart attack and stroke. Cardiovascular disease is the leading cause of death in postmenopausal women.

Perimenopause is referred to as the period the few years leading up the menopause and for the year after menopause that symptoms occur in. Symptoms include increasingly irregular cycles, night sweats, hot flashes, anxiety, mood swings, depression, problems with concentration and memory, vaginal dryness and painful intercourse, decreased sex drive, noticeable aging of the skin, and joint pain.

## Bioidentical vs. Nonbioidentical HRT

Bioidentical refers to hormones that are identical in structure to those produced by the human body. Many may refer to these hormones as being “natural”, and they are in the sense that they are the same as the natural hormones the body produces, but they are chemically converted from other compounds, often from plants such as soy and yam. Nonbioidentical hormones have a different chemical structure than those found in the body and therefore have different effects on the body.

Some benefits to Bioidentical hormone replacement therapy include protection against heart disease and stroke, reduced risk of endometrial and breast cancer, reduced risk of depression, improved libido, may protect against osteoporosis and cognitive decline, improved cholesterol, better maintenance of muscle mass, and generally fewer unwanted effects than with Nonbioidentical therapy.

Dosing of all of these hormones is very patient specific. Compounding pharmacies can make any strength and combination of these hormones for individualized therapy. Oral capsules and transdermal creams applied to thin-skinned areas (inner thigh, inner arm, lower abdomen) and creams applied to the inner labia are common dosage forms for delivery of the Bioidentical hormones.

## Estrogen

Roles and properties of estrogen:

- 3 kinds in the body: estrone (10-20%, thought to promote hormone-mediated cancers), estradiol (10-20%), and estriol (60-80%, thought to be protective against breast cancer and other types of hormone-mediated cancer).
- Creates endometrium
- Development of secondary sexual characteristics at puberty
- Regulates menstrual cycle
- Plumps vaginal tissue and reduces vaginal dryness
- Adds moisture to skin
- Slows bone loss (does not promote more bone formation)
- Can help reduce incidence of heart attacks
- Anti-aging factor
- Increases sensitivity of progesterone receptors
- Affects more than 300 tissue systems in the body
- Uplifts mood
- Decreases LDL and increases HDL
- Decreases lipoprotein A and homocysteine
- Affects many neurotransmitters in the brain including serotonin, dopamine and GABA
- Affect brain function responsible for memory and motivation
- Needed for verbal memory and to learn new concepts, reasoning and fine motor skills
- Promote proliferation and growth of specific cells in the body

Symptoms of estrogen deficiency:

- Hot flashes and/or night sweats
- Fatigue
- Headaches/migraines
- Vaginal and/or bladder infections, UTIs
- Incontinence
- Forgetfulness, poor concentration, decreased verbal skills
- Insomnia
- Testosterone imbalance
- Lower libido

- Painful intercourse
- Osteoporosis
- Episodes of rapid heartbeat
- Irregular bleeding
- Depression, anxiety, emotional instability, tearful, feelings of despair

Symptoms of excess estrogen:

- Breast cyst/breast adenomas/breast pain
- PMS
- Irregular bleeding or heavy menstruation
- Fluid retention, bloating, weight gain
- Headaches
- Gall bladder problems
- Blood sugar problems
- Nutrient deficiencies
- Nervous/irritable/mood swings
- Low libido
- Fibroids
- Hormonal cancers
- Nausea
- Endometriosis
- Thyroid problems
- Sleep disturbances
- Sugar cravings

Possible unwanted effects of Nonbioidentical estrogen replacement include:

- Breast tenderness, headaches, leg cramps, gallstones, worsened uterine fibroids and endometriosis, vaginal bleeding, high blood pressure, blood clots, nausea and vomiting, fluid retention, impaired glucose tolerance, and increased risk of endometrial and breast cancers

## **Progesterone**

Roles and properties of progesterone:

- Decreases menstrual bleeding, reduces spotting
- Decreases fat storage
- Increases metabolism rate
- Protective against endometrial cancer
- Protective against breast cancer
- Inhibits fibrocystic breast disease
- Increases body supply of oxygen
- Helps prevent hardening of the arteries, tones blood vessels
- Improves brain function and memory, protects brain chemistry
- Calms and protects nervous system
- Natural antidepressant, reduces irritability and anxiety, helps with adaptation and resistance to stress
- Helps regulate water retention, natural diuretic
- Required for conception and gestation, protect against miscarriage
- Increases intelligence of fetus
- Mild sedative in large doses
- Prevents PMS
- Stimulates new bone formation
- Anti-aging to skin

- Facilitates thyroid hormone action and thymus gland action
- Normalizes blood sugar levels, zinc and copper levels
- Reduces cravings for sweets, carbs
- Helps prevent high blood pressure
- Improves efficiency of the heart
- Increases HDL and lowers triglycerides
- Reduces testosterone imbalance
- Increases sensitivity of estrogen receptors
- Blocks estrogen's side effects and excessive estrogen
- Useful in some cases of seizure disorder
- Reduces risk of autoimmune diseases
- Increases IgE antibodies to help prevent sinus, respiratory, and vaginal infections and allergic reactions
- Restores sex drive
- Precursor to corticosteroids and other hormones
- Increases endurance during exercise

Symptoms of progesterone deficiency:

- Fibrocystic breasts or breast pain
- Fibroids
- Anxiety, stress, irritability, sleep disturbances, mood swings, confusion, depression, nervousness, jittery
- Headaches, migraines
- PMS, cramps, fluid retention, weight gain
- Break through bleeding or heavy bleeding, irregular cycles
- infertility
- Low body temperature
- Hair loss, bone loss
- Hypothyroidism

Possible unwanted effects of Nonbioidentical progesterone replacement include:

- Birth defects if taken when pregnant
- Breast cancer, breast tenderness, milk production
- Blood clot formation (especially in lungs or brain), cardiac arrest
- Respiratory depression
- Seizure
- Cholestatic jaundice
- Fluid retention, weight gain
- Skin rash, acne, hair loss, unwanted facial hair
- Depression, irritability, lethargy, nervousness
- Impaired glucose tolerance
- Menstrual irregularities including amenorrhea

### **Testosterone**

Roles and properties of testosterone (androgens):

- Cardiovascular protection
- Help with brain function
- Build bones
- Enhance libido
- Build muscle
- Anti-aging effects on skin
- Antidepressant

Symptoms of androgen deficiency:

- Loss of libido, impaired sexual function
- Depression, lack of motivation and confidence
- Aches/pains/arthritis
- Incontinence
- Thinning skin
- Thin tissue of vulva and labia
- Loss of muscle tone
- Wrinkled skin
- Lichen sclerosus
- Hot flashes

Symptoms of excess androgens:

- Acne, oily skin
- Facial hair
- Thinning scalp hair
- Deepened voice
- Ovarian cyst
- Hypoglycemia
- Mid-cycle pain
- Low HDL
- Breast cancer risk
- Painful nipples
- Agitated, angry, irritable

**DHEA**

Like other hormones, DHEA levels decrease with age. Levels are at a peak between the ages of 25-30 so this decline starts earlier than compared with other hormones. Some DHEA is converted into estrogens and testosterone. DHEA itself has been thought to be involved in prevention of heart disease and cancer, as well as improve weight loss and diabetes. Restoring DHEA may help to increase estrogen and testosterone levels.

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