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Cornell University Program on  
Breast Cancer and Environmental Risk Factors  
in New York State (BCERF)

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FACT SHEET #40

## Hormone Treatments and the Risk of Breast Cancer

- 1) Hormone Treatment After Menopause and the Risk of Breast Cancer
- 2) Use of Birth Control Pills and the Risk of Breast Cancer

*Three recent clinical trials have changed the way postmenopausal hormone treatment is viewed. One of the trials was ended because of increases in breast cancer risk related to the treatment. Further, the decrease in the risk of heart and blood vessel disease, that was expected, was not found in any of these trials. Major health organizations have responded and suggested that use of this type of therapy be discontinued for health promotion and most disease prevention purposes.*

*The decision to use birth control pills is difficult. Use of birth control pills has been associated with a small increase in breast cancer risk during the time that the pills are taken. Birth control pills also have other potential risks and benefits, beyond preventing pregnancy.*

### 1) Hormone Treatment After Menopause and the Risk of Breast Cancer

#### **What is menopause, and what physical symptoms are associated with this period of a woman's life?**

Menopause is the time in a woman's life when she stops having menstrual periods completely. The average age of menopause in North American and European women is about 51 years old. Both her health and the society she lives in affect how a woman deals with menopause. At midlife, women experience a number of the physical effects of getting older, and some symptoms often associated with menopause are simply the result of aging not menopause itself.

Symptoms that women experience at menopause vary among cultures. North American and European

women often have hot flashes, night sweats, and vaginal dryness. Hot flashes cause problems for many but not all women. The number of hot flashes increases during the time leading up to menopause. They are most frequent at about the time of menopause and then decline rapidly afterward. Symptoms that women have that may or may not be connected with menopause are incontinence (leaking urine when sneezing or laughing), forgetfulness, depression, a decrease in sexual desire, and joint pains.

#### **How do hormone levels change during a woman's transition to menopause?**

The levels of hormones that are important for childbearing change at this period of a woman's life.



Hormone levels normally change during a woman's menstrual periods but during the time before menopause, the changes become more frequent. After menopause, the levels of a number of hormones change in both directions. Estrogen and progesterone levels are greatly decreased but the levels of other reproductive hormones are increased or may decrease. After menopause, women's fat tissues become the major source of estrogen and may affect estrogen levels.

### **Do the hormone changes at menopause carry health risks?**

Lower levels of estrogen in women after menopause contribute to one type of osteoporosis (brittle bones) and may play a role in heart disease. The relationship between estrogen and osteoporosis and heart disease is discussed below. Changes in the levels of the other reproductive hormones have not been directly linked to adverse health effects. On the other hand, a woman's lifetime exposure to estrogen is thought to be related to her risk of breast cancer and an earlier age at menopause and loss of estrogen are associated with lower breast cancer risk.

### **What is postmenopausal hormone treatment and why is it used?**

Postmenopausal hormone treatment (hormone replacement therapy) is the use of estrogen alone or together with progesterone after menopause.

Postmenopausal hormone treatment has typically been prescribed in the past to women for three purposes: 1) to limit the symptoms of menopause; 2) to reduce bone loss in women with or at risk for osteoporosis; and, 3) to potentially decrease the risk of heart disease in postmenopausal women.

Estrogen may be given alone if a woman has had her uterus surgically removed (hysterectomy). Hormone treatment is also given to women whose ovaries have been removed surgically for medical reasons

(ovariectomy, oophorectomy). Estrogen given alone increases the risk of uterine (endometrial) and ovarian cancer. Adding progesterone to the treatment limits the negative effects of estrogen on the uterus, so women, with a uterus, are given progesterone with estrogen. Progesterone must be given along with estrogen treatment for at least 10 days of a monthly cycle of treatment. Epidemiological studies indicate no increase in the risk of uterine cancer among women who use postmenopausal hormone treatment with estrogen and continuous progesterone but this is not yet known for certain. Hormone treatment may also be used over the short term to control some of the symptoms of menopause.

### **Does postmenopausal hormone treatment increase the risk of breast cancer?**

Women who use postmenopausal hormone treatment have a higher risk for breast cancer compared with women who do not use hormone treatment. In the past, hormone treatment used estrogen alone and the effects of this treatment have been studied more extensively. These early studies saw breast cancer risk increase the longer the length of the estrogen treatment. Breast cancer risk among women who used hormone treatment with estrogen alone increased about 2% for each year of use compared to women who did not use hormones. When hormone treatment is stopped, risk falls to previous levels over a period of five years. Today, most women who receive postmenopausal hormone treatment use estrogen combined with progesterone. A number of recent epidemiological studies indicate that estrogen with progesterone treatment increased breast cancer risk by 6% to 8% for each year of use. Confirming these results, a large clinical trial examining estrogen with progesterone treatment in healthy women, the Women's Health Initiative, was recently ended prematurely because of an association of excessive breast cancer risk with this treatment. Trials of this type are the 'gold standard' for examining drug effects and this early termination result raises strong



concern about the use of estrogen with progesterone as a beneficial treatment for healthy women after menopause.

### **Does postmenopausal hormone treatment prevent or help control heart and blood vessel disease?**

It is unlikely that postmenopausal hormone treatment can prevent or help control existing heart disease. Early studies had found benefits of hormone treatment for reducing the risk of heart and blood vessel disease in women. The results of these early studies were limited because they compared women who chose to use hormone treatment to women who did not. Women in these studies who chose to use hormones may have differed from women who did not in important ways that would have affected their heart disease risk such as diet or exercise. A more definite way to determine how hormone treatment affected heart disease is through a clinical trial. In these studies, individuals are randomly assigned to receive an active or inactive (placebo) treatment, and which treatment a person receives is unknown until the study is ended. Recent clinical trials have examined the effect of postmenopausal hormone treatment for the treatment of women who already have heart disease. Two trials examined the effect postmenopausal hormone treatment on women with existing heart and blood vessel disease. The results of both studies surprised researchers by showing no benefit of hormone treatment for women who already had heart disease. These studies have questioned the idea that postmenopausal hormone treatment could help control heart disease. This question was answered by The Women's Health Initiative, the large clinical trial examining estrogen with progesterone for potential benefits including those to the heart and blood vessels. Although this study had to be terminated early, it indicated that it was unlikely that estrogen with progesterone treatment would be of benefit for heart and blood vessel disease. Both the National Heart, Lung and Blood Institute and the American Heart

Association have recommended that use of this type of therapy for women with existing disease or for prevention of heart and blood vessel disease be discontinued.

### **Does postmenopausal hormone treatment reduce the risk of osteoporosis?**

Continuous postmenopausal hormone treatment will reduce the risk of osteoporosis and is one treatment that can be used for this disease. Osteoporosis happens when bones lose calcium and other minerals, making them more fragile and easily broken. Osteoporosis is a serious problem; broken bones can lead to pain, infection, limited ability to get around, and even death. Whether a woman develops osteoporosis as she gets older depends on how much bone she has built up by about age 30 and how quickly she loses calcium from her bones as she gets older. While some bone loss occurs in everyone with aging, some women are more likely to get osteoporosis. Risk for osteoporosis depends on a woman's family history, her estrogen levels, her diet, the amount of exercise she gets, and whether she smokes or drinks alcohol. The loss of estrogens at menopause is considered to be responsible for a short period of quick bone loss during this life period. Significant osteoporosis is seen in about a third of postmenopausal women in the United States. Prevention of osteoporosis does not necessarily require hormone treatment. Successful risk reduction has also been reported using calcium and vitamin D supplements and exercise. The best prevention is adequate calcium and vitamin D intake and physical activity in childhood and adolescence. The Women's Health Initiative (the clinical study described above) is also studying calcium and vitamin D supplements as treatments to prevent osteoporosis in postmenopausal women.

### **Are there other health risks associated with postmenopausal hormone treatment?**

Other studies have indicated that women who used postmenopausal hormone treatment may have higher



rates of ovarian cancer, gall bladder disease, and problems associated with increased blood clotting compared to women who did not use hormone treatment. Postmenopausal hormone treatment with estrogen and progesterone may be associated with a small increase in ovarian cancer risk. Women who use hormone therapies containing estrogen had two to four times the amount of gall bladder disease compared to women who did not use hormone treatment.

### **How can women weigh the benefits and the risks of hormone treatment for themselves?**

Women, with their health care providers, should decide whether to use postmenopausal hormonal treatment based on their current health, the severity of their menopausal symptoms, and their health history. Risk factors that should be considered are a family or personal history of breast cancer and

other reproductive cancers, a personal history of blood clotting problems, existing heart and blood vessel disease, and a personal history of gall bladder disease. Women with a family history of heart and blood vessel disease or women at risk for osteoporosis may benefit from hormone treatment. It should also be noted that other medications and lifestyle changes could be used to control these diseases, as well as the symptoms of menopause.

### **Should breast cancer survivors consider hormone treatment?**

Hormone treatment is not recommended for breast cancer survivors. Known or suspected breast cancer is currently considered a contraindication for hormone treatment. Investigators have suggested the need for randomized clinical trials, to assure safety, before breast cancer survivors use hormone therapy.

## **2) Use of Birth Control Pills and the Risk of Breast Cancer**

### **What hormones are used in birth control pills and how do they work?**

The birth control pills used today contain an estrogen and a progesterone. Birth control pills are thought to prevent conception by acting on the reproductive system in four complementary ways: 1) they prevent ovulation, the release of an egg; 2) they interfere with movement of the egg to the sites for fertilization and then growth; 3) they hamper preparation of the uterus (womb) to receive the fertilized egg; and 4) they change the consistency of cervical mucus, making it difficult for sperm to reach and fertilize the egg. Birth control pills are very effective. Used properly they prevent pregnancy in 97% to 98% of menstrual cycles.

### **Is the use of birth control pills associated with increased breast cancer risk?**

Women who are currently taking birth control pills have a small increase in their risk of breast cancer relative to women who had never taken birth control. This finding is the result of the co-operative reanalysis of 54 studies (53,000 women with breast cancer and 100,000 women as controls) that examined the relationship between birth control pills and breast cancer risk. Ten years after women had stopped using birth control pills their risk for breast cancer was back to normal. How long birth control pills were used, the dose of hormone or the type of the hormone used did not have an effect on breast cancer risk. However, women who began using birth



control pills before age 20 may have a greater risk of premenopausal breast cancer than women who started birth control use later in life. It is currently unclear if women with a family history of breast cancer may increase their risk of breast cancer if they use birth control pills. More studies are needed examining women who began birth control pill use early in life and women with a family history of breast cancer.

One of the limits to understanding how birth control pills affect breast cancer risk is that their hormone composition has changed several times since the time they were first released. Birth control pills in use today use lower hormone doses than those used in the past. These lower dose pills have not been in use long enough to have been included in many of these studies. More studies are needed to determine if the lower dose of hormones in currently used birth control pills has changed their effect on breast cancer risk.

### **Is birth control pill use associated with other health risks?**

Three other groups of health risks have been associated with birth control pill use. First, their use is linked with an increased risk of blood clots, especially in women older than 35 who smoke. Second, their use is potentially associated with an increase in the risk of some other cancers, such as liver and cervical cancer. Third, their use is associated with other changes in body systems and hormone levels. For example, birth control pills increase one's risk of gall bladder disease.

### **Are there health benefits associated with birth control pill use?**

The use of birth control pills containing estrogen and progesterone has been associated with decreased risk of ovarian and uterine cancers. In general, risk of both these cancers was reduced by approximately 50%.

The health risks for women during pregnancy are greater than those seen among women who use birth control pills. For instance, the risk of increased blood clotting during pregnancy is higher than that seen during birth control use. Nonetheless, it should be kept in mind that a number of other safe and effective methods of birth control also exist.

### **Should breast cancer survivors use birth control pills?**

It is not recommended that women who are survivors of breast cancer use birth control pills. As with hormone therapy, known or suspected breast cancer is a contraindication for using these drugs.

#### **What can women do now?**

- Maintain a healthy heart and bones by getting plenty of exercise.
- Maintain a healthy body weight, neither too fat nor too thin.
- Eat plenty of calcium rich foods such as low fat dairy products, leafy greens and hard tofu and make sure that their calcium intake is a least 1000 mg daily before menopause and 1200 mg daily after menopause.
- Do not smoke.
- Choose a diet low in fat, especially saturated fats from meat and dairy products.
- Choose a diet high in fiber from whole grains, vegetables, and fruits.




**An extensive bibliography on *Hormone Treatments and the Risk of Breast Cancer* is available on the BCERF web site: <http://www.cfe.cornell.edu/bcerf/>**

*Prepared by  
Barbour S. Warren, Ph.D.  
Research Associate, BCERF  
and  
Carol Devine, Ph.D., R.D.  
Division of Nutritional Sciences and  
Education Project Leader, BCERF*

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***Program on Breast Cancer and  
Environmental Risk Factors (BCERF)***  
College of Veterinary Medicine  
Cornell University  
Box 31  
Ithaca, NY 14853-5601

Phone: (607) 254-2893  
Fax: (607) 254-4730  
email: [breastcancer@cornell.edu](mailto:breastcancer@cornell.edu)  
WWW: <http://envirocancer.cornell.edu>