Breast Cancer Risk Factor Information

This document gives a general overview of risk factors. The document covers:

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About Cancer and Risk Factors

Cancer is not just one disease.

Cancer is a group of over 100 different diseases. Cancer occurs when abnormal cells grow out of control and crowd out the normal cells. It can start anywhere in the body and can spread (metastasize) to other parts of the body. Cancer types are named for the original location in the body and the type of cell or tissue. Different types of cancer have different causes and risk factors.

Cancer can take a long time to develop.

The cause of cancer is sometimes related to events that happened many years ago. Most cancer types are thought to take anywhere from 10 to over 50 years to develop. A few types, such as leukemia or lymphoma, are thought to take less than 10 years.

A risk factor is anything that increases your chance of getting cancer.

Some risk factors can be controlled while others cannot. Risk factors can include:

- Hereditary conditions (e.g., genes passed down from parents)
- Medical conditions or treatments (e.g., a previous cancer diagnosis)
- Infections (e.g., human papilloma virus)
- Lifestyle factors (e.g., smoking cigarettes)
- Environmental exposures (e.g., certain air pollutants)

Most risk factors do not directly cause cancer.

A risk factor influences the development of cancer but usually does not directly cause cancer. Instead, a combination of risk factors likely drives cancer development. For example, genetic factors can make individuals more likely to get cancer when they are exposed to a cancer-causing chemical.

Environmental risk factors depend on how, how much, and how long you are exposed.

Your risk from exposure to certain chemicals or radiation depends on the type, extent, and duration of exposure. For example, inhaling a certain chemical may increase your risk of getting cancer. However, touching the same chemical may not. In addition, some substances may increase your risk only if you are exposed to high amounts over a long time.

It is difficult to identify the exact causes of cancer.

- Many cancers can develop due to random chance.
- Multiple risk factors can act in combination.
- Risk factors can change over time.
- Cancer might not develop or get diagnosed for a long time after an initiating event (such as exposure or random cell mutation).

Knowing your risk factors can help you make more informed choices.

Discuss your risk factors with your health care provider to make more informed decisions on lifestyle and health care.

About Breast Cancer

Breast cancer is the most common cancer in women in the United States.

Breast cancer accounts for about 1 in 3 cancer diagnoses in women in the United States. A woman has about a 1 in 8 chance of developing breast cancer in her life.[2, 9] The American Cancer Society estimates that 287,850 women in the U.S. and 6,710 women in Massachusetts will be diagnosed with invasive breast cancer in 2022.[1] Since the mid-2000s, incidence rates of invasive breast cancer have increased by 0.5% each year.[1, 2, 6]

Breast cancer is rare for men.

Men can develop breast cancer, but it accounts for less than 1% of male cancer diagnoses.[1, 7] White men are about 100 times less likely than white women to develop this cancer, and black men are about 70 times less likely than black women to develop it.[5] For more information on breast cancer in men, visit the American Cancer Society website at www.cancer.org.[5]

Most breast cancers occur in women age 55 or older.

The risk of developing breast cancer increases with age. About 70% of women diagnosed with breast cancer are age 55 and older.[2, 6, 10, 11] A very small number of women diagnosed with breast cancer are younger than 45.[2]

Although white women are more likely to develop breast cancer, black women are more likely to die from it.

Before age 40, non-Hispanic Black women have a higher chance of developing breast cancer than non-Hispanic white women.[2, 3, 6] Between the ages of 65 to 84, non-Hispanic white women are most likely to be diagnosed with breast cancer followed closely by non-Hispanic black women.[3] Hispanic, Asian/Pacific Islander, and American Indian/Alaskan Native women are less likely to develop breast cancer.[2, 3, 6]

At any age, non-Hispanic black women are more likely to die from breast cancer than any other race or ethnic group.[2, 3]

Types of Breast Cancer

Breast cancers are either *in situ* or invasive.

- An *in situ* breast cancer is considered the earliest stage of cancer. It has not invaded the breast's deeper tissues or spread to other organs. *In situ* breast cancers are also referred to as non-invasive breast cancers.[2]
- An invasive breast cancer has spread beyond the layer of cells where it started into surrounding tissues and can spread (metastasize) to other parts of the body.[2]

The remainder of this risk factor summary will focus on invasive breast cancers. For more information on *in situ* breast cancers and other benign (non-cancerous) breast conditions, visit the American Cancer Society website at www.cancer.org.[2, 4]

Most breast cancers are invasive (or infiltrating).

The two most common types of breast cancer are invasive ductal carcinoma and invasive lobular carcinoma.[2, 6]

- Invasive ductal carcinoma begins in cells that line the milk duct of the breast. It makes up about 70-80% of all invasive breast cancers.
- Invasive lobular carcinoma begins in the milk-producing glands (lobules) of the breast. It accounts for 10% of invasive breast cancers. Invasive lobular carcinoma may be harder to detect by a mammogram.

Less common types of breast cancer include inflammatory breast cancer, Paget's disease of the breast, angiosarcoma, and Phyllodes tumor.[2]

Certain properties of breast cancer cells inform treatment decisions.

Breast cancer cells are tested for two hormone receptors and a certain protein. Breast cancer tumors can be:

- Hormone receptor-positive: These breast cancer cells have either an estrogen receptor (ER), progesterone receptor (PR), or both. About 66% of breast cancers are ER and/or PR positive and are more common after menopause. They can be treated with hormone therapy.
- Human epidermal growth factor receptor 2 (HER2)-positive: These breast cancer cells have high levels of the HER2 protein, making them grow quickly. About 10-20% of breast cancers are HER2-positive and can be treated with drugs that target the HER2 protein. They can also be hormone receptor-positive.
- Triple-negative: These breast cancer cells do not have an estrogen receptor, progesterone receptor, or excess HER2 protein. They grow and spread faster than most other types of breast cancers. These breast cancers tend to be more common in women younger than 40 and can be difficult to treat.[2, 6, 10]

Known Risk Factors

Medical Conditions

Non-cancer breast conditions:

Certain benign (non-cancerous) breast conditions may increase breast cancer risk, including:

- Lobular neoplasia (a change in the cells of the milk-producing glands)[2, 6]
- Proliferative lesions with atypia (abnormal cells in the ducts or milk-producing glands that grow excessively)[2]
- Dense breast tissue (as seen on a mammogram)[2, 6]

Previous breast cancer diagnosis:

A woman with cancer in one breast has a higher risk of developing a new cancer in the other breast or in another part of the same breast. This is different from a recurrence or return of the first cancer[2, 6]

High lifetime exposure to estrogen and progesterone:

A longer lifetime exposure of the breast tissue to estrogen and progesterone can increase breast cancer risk. Several factors can increase risk, including:

- Starting menstruation before age 11 or 12
- Going through menopause after age 55
- Having a first pregnancy after age 30, or never having a full-term pregnancy[2, 6]

Menopausal hormone therapy:

Use of menopausal hormone therapy (also called post-menopausal hormone therapy or hormone replacement therapy) may affect breast cancer risk.

- Combined hormone therapy with both estrogen and progesterone increases the risk of breast cancer. The risk seems to decrease within 5 years of stopping treatment but does not disappear completely.
- Estrogen-only therapy does not appear to increase the risk of breast cancer.[2, 6, 11]

If you are considering menopausal hormone therapy, discuss the possible risks and benefits with your health care provider. In general, if a woman decides to use hormone therapy, it is usually best to use it at the lowest dose for as short a time as possible.[2]

Previous radiation therapy to chest:

Women who have had radiation therapy to the chest as treatment for another cancer (e.g., Hodgkin or non-Hodgkin lymphoma) have a higher risk for breast cancer.[2, 11] The risk is highest if the radiation occurs as a teen or young adult, when the breasts are still developing. Radiation treatment after age 40 to 45 does not seem to increase breast cancer risk.[2]

Prior use of diethylstilbestrol (DES) drug:

From the 1940s to the early 1970s, some pregnant women were given DES because it was thought to lower their chances of miscarriage. Use of DES slightly increases breast cancer risk. A woman whose mother took DES while pregnant may also have a slightly higher risk of breast cancer.[2]

Hereditary Conditions

Family history of breast cancer:

Having a family history of breast cancer increases a woman's risk of developing the disease. A woman has a higher risk if she has:

- Several close blood relatives (e.g., grandparents, aunts, cousins) diagnosed with breast and/or ovarian cancer.[6]

- A first-degree relative (i.e., mother, sister, or daughter) diagnosed with breast cancer. This almost doubles the risk. Having two first-degree relatives with breast cancer increases the risk by about 3 times.[2]
- A father or brother with breast cancer.[2, 6]

It is important to note that most women with breast cancer do not have a family history of the disease.[2]

Inherited gene mutations:

About 5-10% of breast cancers likely result from a genetic mutation passed down from a parent.[2] Most of these mutations occur in the *BRCA1* and *BRCA2* genes. On average, women with *BRCA1* mutations have a 65% chance of developing breast cancer by age 70 and women with BRCA2 mutations have about a 45% chance. In the United States, BRCA mutations are more common in Jewish people of Ashkenazi (Eastern Europe) origin. Other less common gene mutations can increase the risk of breast cancer, including *ATM*, *CHEK2*, *NF1, TP53*, *PTEN, CDH1, STK11,* and *PALB2*.[2, 11]

Lifestyle Factors

Drinking alcohol:

Drinking alcohol is clearly linked to increased risk of breast cancer. The risk goes up with higher amounts of alcohol consumed.[2, 6]

- Women who drink one alcoholic drink per day have a small increase in risk.[2]
- Women who have 2 to 3 alcoholic drinks per day have about a 20% higher risk compared to non-drinkers.[2]

Being overweight or obese:

After menopause (when the ovaries stop making estrogen), most estrogen comes from fat tissue. Being overweight or obese after menopause increases a woman's risk of breast cancer.[2, 6, 11] Similarly, women who are less physically active may have an increased risk of breast cancer, especially in women past menopause.[2, 6]

Higher socioeconomic status:

The risk of breast cancer is higher in women of higher socioeconomic status (e.g., higher income, education), but is not due to socioeconomic status itself. Instead, this may be due to multiple reproductive and lifestyle risk factors (e.g., later age at first pregnancy, fewer children, greater use of menopausal hormone therapy, easier access to screening, etc.).[6, 11]

Possible Risk Factors

Medical Conditions

Birth control use:

Use of birth control may affect breast cancer risk.

- Women using birth control pills (oral contraceptives) have a slightly greater risk of breast cancer. However, the risk seems to return to normal within 10 years after stopping.
- Some studies suggest women using long-acting progesterone birth control shots (such as Depo-Provera) every 3 months may have an increase in breast cancer risk, but not all studies have found this.
- Some studies suggest women using a hormone-releasing intrauterine device (IUD) may have an increased risk.

Few studies have looked at breast cancer risk from birth control implants, skin patches, and vaginal rings. If you are considering hormonal birth control, discuss your breast cancer risk factors with your health care provider.[2]

Height

Many studies have found that taller women have a higher risk of breast cancer than shorter women. The reasons for this aren't exactly clear, but it may have something to do with factors that affect early growth, such as nutrition early in life, as well as hormonal or genetic factors.[2]

Lifestyle Factors

Smoking:

Recent research suggests that long-term heavy smokers may have a slightly higher risk of breast cancer, with risk increasing for certain groups, such as women who started smoking before having their first child.[2] Information about quitting smoking and related services is available from the Massachusetts DPH Tobacco Cessation and Prevention Program at 1-800-Quit-Now or 1-800-784-8669.

Secondhand smoke:

Some studies suggest a possible connection between secondhand smoke and an increased risk for breast cancer, particularly in premenopausal women. However, this is still being studied.[2, 11]

No history of breastfeeding:

Women who have breastfed (especially for 1 year or more) might have a lower risk for breast cancer. Experts think this might be because breastfeeding reduces the number of menstrual cycles in a woman's lifetime, lowering exposure to estrogen and progesterone.[2, 11]

Working the night shift:

Some recent studies have suggested that working the night shift may increase the risk for breast cancer. The light-sensitive hormone melatonin may play a role in this link. Further research is looking into this possibility.[2, 8]

Environmental Exposures

Exposure to chemicals with estrogen-like properties:

A great deal of research has been done trying to understand possible environmental risk factors for breast cancer. Some environmental chemicals, such as endocrine disruptors, elicit hormonal responses or have estrogen-like properties. [2, 11] In theory, estrogen-like chemicals could affect breast cancer risk. These chemicals can be found in certain:

- Plastics
- Cosmetics and personal care products
- Pesticides
- PCBs (polychlorinated biphenyls) [2]

One research program found that exposure to endocrine disrupting chemicals during prenatal development, puberty, pregnancy, and menopausal transition was associated with an increased risk for breast cancer.[12] However, there is no clear link between exposure to these substances and breast cancer risk.[2]

Other Risk Factors That Have Been Investigated

Medical Conditions

Miscarriages and pregnancy terminations?

Several studies have found that miscarriages and pregnancy terminations (either induced or spontaneous abortions) do not affect breast cancer risk.[2, 11]

Lifestyle Factors

Antiperspirants?

Use of antiperspirants has been investigated as a possible risk factor for breast cancer. Based on the available evidence, no associations or scientific basis have been found linking breast cancer risk with use of antiperspirants.[2, 11]

Bras?

No scientific or clinical evidence indicates that bras can cause breast cancer.[2, 11]

Breast implants?

Breast implants have not been linked to an increased risk for the most common types of breast cancer. However, breast implants with a textured surface have been linked to a rare cancer, breast implant-associated anaplastic large cell lymphoma (BIA-ALCL), which can form in the scar tissue around the implant.[2]

Dietary fat intake?

Studies of women in the United States have not found a consistent link between high-fat diets and breast cancer risk. One large study found a high-fat diet during adolescence was associated with a moderate increase in premenopausal breast cancer risk. Studies have found breast cancer is less common in other countries where the typical diet is lower in total, polysaturated, and saturated fats, but this association is complicated by other factors (such as activity level, intake of other nutrients, and genetic factors).[2, 11]

References / More Information

This information sheet should not be considered exhaustive. For more information on other possible risk factors and health effects being researched, please see the resources below. Much of the information contained in this summary has been taken directly from these sources. This material is provided for informational purposes only and should not be considered as medical advice. Consult your physician if you have questions regarding a specific medical problem or condition.

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