

# Breast and Ovarian Cancer Susceptibility Genes

## What are genes?

Genes, which are in each of our body cells, help guide the growth and development of our bodies. We are all born with two copies of each gene - one we inherit from our mother and the other from our father.

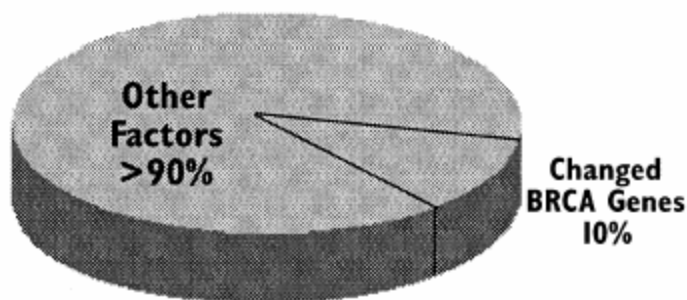
## What are the breast and ovarian cancer susceptibility genes?

Some families carry certain genes that have been altered or changed and do not work normally. This may lead to a much higher chance, or susceptibility, for developing breast and/or ovarian cancer. These genes are called the breast cancer susceptibility genes (BRCA). Men in some of these families may have a chance of developing breast cancer too. You can inherit these changed genes from either your mother's or father's family. So far, only 2 breast cancer susceptibility genes, BRCA1 and BRCA2, have been found. As research continues, new BRCA genes may be identified. While these changed genes result in a higher chance of developing breast or ovarian cancer, they do not cause cancer. Not everyone who inherits a changed BRCA gene will develop breast or ovarian cancer

## If I have a family history of breast or ovarian cancer, does it mean that I may have a changed BRCA gene?

Not necessarily: Most breast or ovarian cancer that occurs within families is not due to inheriting a changed BRCA gene, but is caused by other factors. About 5-10% of breast and ovarian cancers are related to inherited changes in BRCA genes.

## Causes of Breast or Ovarian Cancer.



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## HOW DO I KNOW IF I CARRY A CHANGED BRCA GENE?

Answer "yes" or "no" to the statements below. You may have a higher chance of carrying a changed BRCA gene if you answer "yes" to **one or more** of the following:

- You have a close relative with a positive test for changed BRCA genes.
- You have had both invasive breast and ovarian cancer.
- You have invasive breast or ovarian cancer **and**
- You have one or more close relatives with invasive breast cancer (especially before age 50) and/or ovarian cancer.
- You have a strong family history of invasive breast cancer (specially before age 50) and/or ovarian cancer in many relatives across two or more generations.
- You had invasive breast cancer before you were 40.
- You are of Ashkenazi (Central or Eastern European) Jewish heritage **and** You have had either invasive breast cancer before you were 45, or ovarian cancer.
- You have had invasive breast cancer that appeared in both breasts or in many places in the same breast.
- You are a man with invasive breast cancer.

## If I have a higher chance of carrying a changed BRCA gene (I answered 'yes' to one of the statements above), what should I do?

First, talk with your provider about your concerns. After confirming your risk by looking at your family history and your personal health history, your provider may refer you to a genetic counselor. Genetic counseling is the **first** step in determining if a changed BRCA gene is in your family and the chance that you may have inherited this gene. During counseling, the genetic counselor will review your medical records, your health history & your family history of cancer.



The information presented here is intended to diagnose health problems or to take the place of professional medical care. If you have persistent health problems or if you have further questions, please consult your health care provider.

***If I don't have a higher chance of carrying changed BRCA genes (I did not answer 'yes" to any of the statements) should I go to genetic counseling and consider testing?***

Not at this time. The only genetic test available is for individuals who are at high risk. If your family history of breast cancer does not fall into the high risk pattern but continues to concern you, talk with your provider.

***Is there a test to find out if I have a changed BRCA gene?***

If it seems like there may be an inherited susceptibility to cancer in your family, a blood test for the BRCA genes may be available. However, the test is not for everyone. It is sometimes useful for individuals thought to be at high risk. The genetic counselor will go over the pros and cons of testing with you (see side bar). With this information, you can decide, with your genetic counselor, whether this test is right for you.

***What can I do to take care of myself?***

Since all women are at risk for breast cancer, **screening** to find breast cancer early when it is most treatable and curable is a very important step you can take for yourself.

***There are 3 important screening steps you can take to find breast cancer in the early stages***

- 1)monthly breast self-exam,
- 2)breast exams in the medical office, and
- 3)regular mammograms.

Mammography is strongly recommended for all women who are between the ages of 50 to 74. If you are age 40 to 49, talk with your health care provider about the age to begin regular mammograms. If you are considered high risk your provider may suggest that you begin mammography screening earlier.

A healthy, lower fat diet, regular exercise, drinking alcohol in moderation and not smoking are other very important ways of taking care of yourself that may reduce your chances of developing breast cancer.

## **TESTING FOR BREAST/OVARIAN CANCER SUSCEPTIBILITY**

The decision about taking this test is a very personal one, and can have complex, and sometimes unexpected, emotional effects. An important part of genetic counseling is to help you explore what testing might mean for you and your family. The genetic counselor will discuss the pros and cons of genetic testing, including emotional aspects, impact on the family, confidentiality of results and cancer screening options.

***What are some of the benefits of BRCA testing?***

Some people who get a negative test result are relieved. Others who test positive use the results to help plan their medical care and personal decisions. Although we are not certain, it is likely that having mammograms and breast exams more often, and starting them at a younger age, may help find breast cancer early.

***What are some of the drawbacks to BRCA testing?***

A negative test may give some women a false sense of security, so they may not come in for regular mammograms and breast exams like they should. Testing positive can create stress, especially if no clear plan of action is in place to deal with the results.

***What does it mean if the BRCA test is positive?***

A positive BRCA test means a woman's chance of developing breast cancer may go up as high as 85%; there is still at least a 15% chance that she will not develop breast cancer. It also means that her risk of ovarian cancer is higher. Men who carry a changed BRCA gene may be at risk for breast and other cancers. We do not know yet why some people with changed genes develop cancer, and others do not.