Overview

Inherited Risk for Breast and Ovarian Cancer
Most women with breast or ovarian cancer have no family medical history of these cancers. However, 5% to 10% of breast cancer and 10-15% of ovarian cancers are due to Hereditary Breast and Ovarian Cancer syndrome.1 Many times, these women inherited an abnormal gene that put them at high risk of cancer.

Breast or ovarian cancers could be hereditary if your family has women with:

- Breast or ovarian cancer in more than one generation.
- Breast cancer before menopause.
- Cancer in both breasts.
- Triple negative breast cancer.
- Ovarian cancer diagnosed at any age.

You could also have a hereditary risk if your family has men with breast cancer.

Breast cancer genes can be inherited from your mother or your father, so your father’s family medical history is also important. Some women who have hereditary breast or ovarian cancer don’t have a strong family history of cancer. This can happen if the family is small or if most of the relatives are men.

Breast and Ovarian Cancer Genes
The two most common genes that increase the risk of breast and ovarian cancer are called BRCA1 (Breast CAncer 1) and BRCA2 (Breast CAncer 2).1,2 Disease causing mutations in these genes cause most hereditary breast and ovarian cancers.

There are also other genes that increase the risk of breast cancer and cancers such as leukemia, brain, bone, thyroid, uterus, pancreas, and colon cancers. If you have a strong family medical history of any of these cancers, talk with your doctor about getting a referral to see a genetic counselor.

What if I am Ashkenazi Jewish?
There are over a thousand different mutations in the BRCA1 and BRCA2 genes. Three of these mutations are common in people who are of Ashkenazi Jewish ancestry. Between 2% to 3% of people with Ashkenazi Jewish ancestry have one of these three genetic mutations in the BRCA1 or BRCA2 gene, putting them at a higher risk of cancer.2
If you have breast or ovarian cancer, or if you have a family medical history of these cancers, then the chance of having a gene mutation is higher. The chance is lower if you do not have a history of breast or ovarian cancer. Simply being an Ashkenazi Jew does not increase your risk of developing breast or ovarian cancer in your lifetime.

**Genetic Testing**

The test for mutations in cancer genes, like the *BRCA1* and *BRCA2* genes, can be done by a blood test or cheek swab. It takes about two to three weeks to get results. If possible, the genetic test should be first offered to a family member who has had breast cancer before age 50, or ovarian cancer at any age.

If the test shows that this family member has a gene mutation, other family members who choose genetic testing can be tested for that specific mutation. If you are of Ashkenazi Jewish ancestry, you may only need to have testing for the three mutations found most commonly in this ethnic group.

Insurance will often pay for testing when you have a personal history of cancer and/or there is a strong family history of cancer.

Genetic testing for *BRCA1* and *BRCA2* is not offered to children younger than age 18, because people who have *BRCA1* and *BRCA2* gene mutations do not develop cancer until they are adults.

**The Meaning of Genetic Test Results**

You can get three kinds of results (Positive, Negative, or Uncertain) from genetic testing.

**Positive results**

A positive result means that a harmful change was found in a cancer gene that you were tested for. It does not mean that you will get cancer, but it does elevate your risk of getting cancer. If you get a positive test result, you may want to tell other members of your family (children, brothers, sisters, parents, aunts, uncles, and cousins), because it means they could also have inherited the familial mutation.

**Negative results**

A negative result means that nothing abnormal was found in the cancer genes tested. If you were the first person in your family to have the test, you may have gotten a negative result because you:

- Didn’t inherit the cancer gene mutation.
- Don’t have hereditary cancer.
- Have a mutation in a cancer gene that hasn’t been discovered yet.
- Have a mutation in one of the cancer genes that was missed by the test because of the limitations of the technology. It is recommended that you follow-up with your genetic counselor every 2 to 3 years to determine if additional testing is indicated because of improvements in the technology to detect gene mutations or discovery of new cancer genes.

If you get a negative test result and have a family history of breast or ovarian cancer, talk to your doctor about the level of screening that is right for you.
If you have a negative result after pursuing testing because of having a family member with a known cancer gene mutation, and do not have a family history of breast or ovarian cancer, your risk is the same as an average woman in the general population. This risk is 12.5% for breast cancer and <2% for ovarian cancer, if you live to be 90 years old. As such, you are recommended to follow the general population screening we have available.

**Uncertain results**

Sometimes a change in a cancer gene is found that is not normal, but may not increase the risk of cancer. This is called a “genetic variant of uncertain significance” or VUS. What this means for your cancer risk depends on how much we already know about the particular VUS, and what we could learn by testing other people in your family.

**Potential Advantages of Genetic Testing**

Many women pursue genetic testing because they “just want to know.” Genetic testing may tell you more about your future risk of breast and ovarian cancer. That way, you can take steps to lower your risk of cancer and choose the right level of screening. If you’ve already had cancer, getting tested can help you understand what caused your cancer. If a gene mutation is found, you can pass the information along to your family members to help them understand what their risk may be.

If you haven’t inherited the cancer gene mutation that is in your family, you may be very relieved. You won’t need to worry about extra screening or risk-reducing surgery.

Talking with a genetic counselor that specializes in cancer may help you decide if genetic testing makes sense for your family,. Please see the other handouts in this series (Breast and Ovarian Cancer: Screening and Detection; Lifestyle Changes to Reduce Risk of Breast and Ovarian Cancer; Breast Cancer Chemoprevention; Surgery to Lower the Risk of Breast Cancer; and Surgery to Lower the Risk of Ovarian Cancer) for more information.

**Potential Disadvantages of Genetic Testing**

Genetic testing can impact your relationships with family, but telling them is important. If you are not in contact with your relatives, this could be hard. It may also be difficult for you to tell your children; some parents feel guilty for passing the gene mutation onto their children.

Another disadvantage is that we can’t predict if or when you might get cancer. This can create anxiety and cause women to worry more about cancer. Please let your doctor know if you are feeling sad, anxious, depressed, or confused about your test results so we can recommend support services.

**Insurance Discrimination**

You may be worried about insurance discrimination because of genetic testing results. The risk of insurance discrimination is low, and there are some legal protections in place to keep this from happening.

Life and disability insurance may be affected more by genetic test results. If you are concerned about the possibility of genetic discrimination, talk with an independent insurance agent.
Terms Defined

**Gene:** the instructions you inherit that tell your body how to form, develop and grow.
**Menopause:** when women stop having menstrual periods.
**Mutation:** a gene change that may cause health problems.
**Ashkenazi Jewish:** men and women whose ancestors were originally from the areas including Russia, Poland, and Germany.

Questions
Your questions are important. Call your doctor if you have questions or concerns.

Resources

**Genetic Counseling and Testing**
Seattle Cancer Care Alliance
www.seattlecca.org/genetic-counseling-testing-overview.cfm
206-606-6990

**Breast and Ovarian Cancer Prevention Program**
Seattle Cancer Care Alliance
www.seattlecca.org/breast-ovarian-cancer-prevention-program.cfm
206-606-6100

**Gastrointestinal Cancer Prevention Program**
Seattle Cancer Care Alliance
www.seattlecca.org/diseases/gastrointestinal-diseases/gastrointestinal-cancer-prevention
206-606-6100

**Genetic Medicine Clinic**
University of Washington Medical Center
www.uwmedicine.org/locations/genetic-medicine-uwm
206-598-4030

**Women’s Health Care Center**
University of Washington Medical Center, Roosevelt Way
www.uwmedicine.org/locations/womens-health-care-center-uwm-roosevelt
206-598-5500

**National Cancer Institute’s Cancer Information Service**
www.cancer.gov
800-4-CANCER (800-422-6237)
TTY number: 800-332-8615

**Marsha Rivkin Center for Ovarian Cancer Research**
https://www.rivkin.org/
206-215-6200 or 800-328-1124

**FORCE (Facing Our Risk of Cancer Empowered)**
http://facingourrisk.org
866-606-RISK (7475)
References


