FACTS FOR LIFE

Genetics and Breast Cancer

What are genes?

Every cell in your body contains genes. Genes contain the blueprints (genetic code) for your body. For instance, they contain the code that decides the color of your eyes. They also affect other functions of your body, such as when cells grow, divide and die.

Changes in the genetic code are called mutations. Mutations are rare. Some can be passed on from parent to child (inherited). Most, however, occur during a person's lifetime. We don't know what causes those. Many have little or no effect on health. Others can increase the risk of certain diseases, like breast cancer.

Genes and breast cancer

The best-known genes linked to breast cancer are *BRCA1* and *BRCA2* (BReast Cancer genes 1 and 2). While everyone has these genes, some have an inherited mutation in one or both. Having a *BRCA* gene mutation increases the risk of breast and ovarian cancer.

Who should consider *BRCA1* and *BRCA2* testing?

The chance that you have a *BRCA1* or *BRCA2* gene mutation is greater if:

- You had breast cancer at an early age;
- Your mother, sister or daughter had breast cancer at an early age or ovarian cancer at any age;
- A woman in your family has had breast and ovarian cancer;
- A woman in your family has had breast cancer in both breasts;
- A man in your family has had breast cancer; or
- Your family is of Ashkenazi Jewish descent.

Most breast cancers are not caused by inherited gene mutations. Only about five to 10 percent of breast cancers in the U.S. are due to these mutations.

What about men?

Men can also carry *BRCA* mutations and can pass them on to their children. Men with a *BRCA2* mutation have an increased risk of breast cancer. They may also have an increased risk of prostate cancer.

Are you of Ashkenazi Jewish descent?

In the U.S., between one in 400 and one in 800 people in the general population have a *BRCA1/2* mutation. However, among Ashkenazi Jewish men and women, about one in 40 have one of these mutations.

About 10 percent of Ashkenazi Jewish women diagnosed with breast cancer in the U.S. have a *BRCA1/2* mutation.

Can I find out if I have a *BRCA1* or *BRCA2* gene mutation?

Genetic testing for these mutations is widely available. It involves a blood test that may be covered by insurance. A doctor or genetic counselor can help you decide if a genetic test is right for you. After the test, he or she can also explain the results.

In most cases, the test is done first in the person with breast cancer. If a mutation is not found, the cancer was not likely due to a *BRCA1/2* mutation. So, other family members do not need to be tested.

For more information, visit komen.org or call Susan G. Komen's breast care helpline at 1-877 GO KOMEN (1-877-465-6636) Monday through Friday, 9 AM to 10 PM ET.

Genetic testing

STEP 1: You will provide a family health history. The counselor will explain how this history may impact your risk.

STEP 2: Pre-test counseling will be done to help you decide whether testing is right for you. This includes discussing:

- risks and benefits, such as cost, privacy and the potential knowledge that you carry a gene mutation
- what you will do with the information once you know the test result
- the emotional impact of this information and how it can affect your family

STEP 3: A sample of your blood will be drawn for the test if you decide to proceed.

STEP 4: The sample will be sent for testing. It usually takes three weeks to get results.

STEP 5: The genetic counselor will review and explain the results.

Cost of genetic tests

Check with your health insurance provider to find out if counseling and testing are covered in your plan. If you have an insurance plan that began on or after August 1, 2012, the Affordable Care Act (ACA) requires the test be covered (when recommended by a doctor). If you have a *BRCA1/2* gene mutation, the ACA also requires that counseling be covered. This can help you decide if taking medications to lower the risk is right for you.

At-home genetic testing

You may have seen ads for at-home genetic testing kits. These kits are not recommended to assess breast cancer risk. The U.S. Food and Drug Administration, U.S. Federal Trade Commission and Centers for Disease Control and Prevention all caution against the use of at-home testing kits. The results of any genetic test should be reviewed by a trained doctor or genetic counselor.

Protection from discrimination

Some people are concerned about being treated unfairly based on the result of a genetic test. State and federal laws protect you. The Genetic Information Nondiscrimination Act (GINA) prevents health insurers from denying coverage or charging higher premiums for a person with an increased genetic risk of breast cancer. It also protects employees from unfair treatment at work.

Where can I get genetic testing?

If you would like to learn more about genetic tests, talk with a doctor. A doctor can refer you to a genetic counselor. If your doctor is not aware of one close to you, contact the National Cancer Institute or the National Society of Genetic Counselors. They can refer you to a center near you with counselors on staff. They can also provide more detail about *BRCA1, BRCA2* and genetic testing.

Resources

Susan G. Komen®
1-877 GO KOMEN (1-877-465-6636)
www.komen.org

Facing Our Risk of Cancer Empowered, Inc. (FORCE)
1-866-824-7475
www.facingourrisk.org

National Cancer Institute
1-800-4-CANCER
www.cancer.gov

National Society of Genetic Counselors, Inc.
1-312-321-6834
www.nsgc.org

Got a smartphone? Scan here to view more information at komen.org.

Related fact sheets in this series:

- Breast Cancer & Risk
- Types of Breast Cancer Tumors