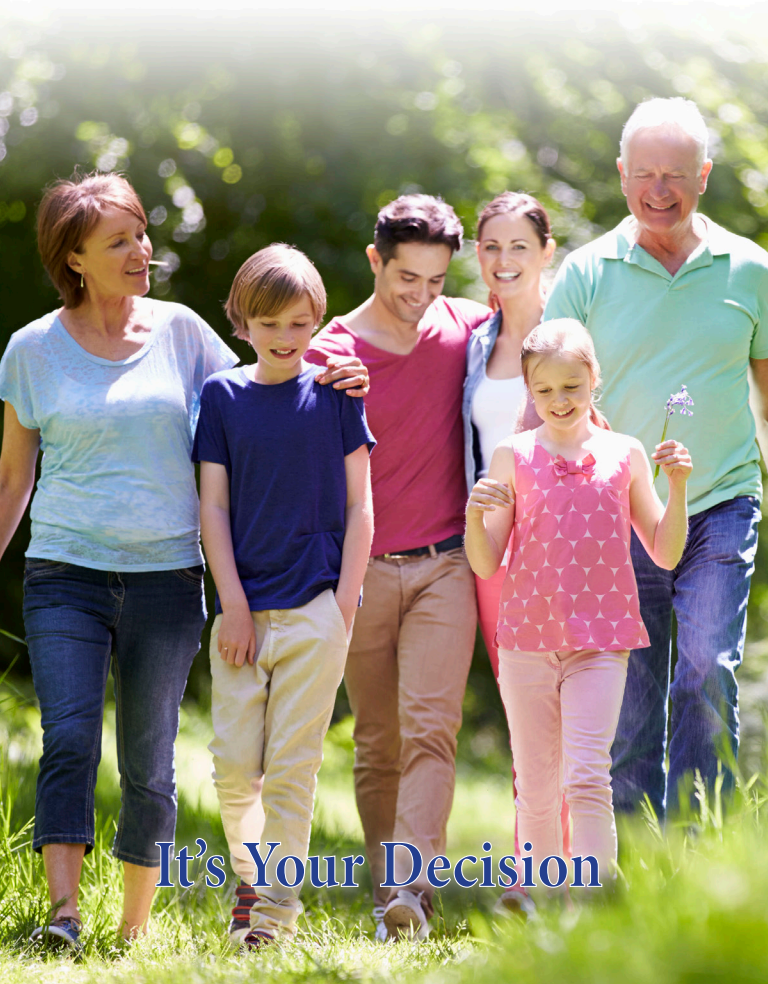
GOPATH® LABORATORIES
Global Pathology Services

GeneticsNow™

A Guide to Testing Hereditary Conditions in Women & Men

Patient & Physician Information



How can BRCA status affect your health?

Everyone has BRCA1 and BRCA2 genes. However, sometimes the DNA that makes up a BRCA gene may become damaged or mutated. When a mutation occurs within these genes, a person's risk for developing certain cancers increases. A parent who has a BRCA mutation can pass this mutation along to his or her son or daughter. However, if your parent has a mutation, that doesn't necessarily mean that you will inherit it.

If either your mother or your father has a BRCA1/2 gene mutation, you have a 50% chance of having the same mutation. If you are found to have a BRCA mutation, this does not necessarily mean you will get cancer, but it does mean that your risk for developing certain hereditary cancers is greater than those who do not have a genetic mutation.

For women with a BRCA mutation, the risk for developing breast and ovarian cancer is significantly increased. They are also at a greater risk for other cancers such as pancreatic cancer and melanoma. Men with a BRCA mutation are at a greater risk of developing prostate cancer and male breast cancer, as well as other hereditary cancers including pancreatic cancer and melanoma. In fact, according to the American Cancer Society, up to 10% of all prostate cancers are caused by inherited genes.

What other genes should I be concerned about?

The majority of hereditary breast and ovarian cancers have been linked to the BRCA 1/2 genes. However, there are other genetic mutations that have been associated with increasing a person's risk for developing cancer. For example, mutations in genes such as BARD1, BRIP1, CHEK2, and TP53 are also associated with hereditary breast and ovarian cancer, which is why we have included them in our BRCA*now*® series.

GoPath's BRCA*now*® panels include as many as 30 genes currently identified as being indicators of hereditary cancer risk. Since new genes are constantly being discovered as having a link to hereditary cancers, we are always researching and adding more genes to our BRCA*now*® panels to give patients the most current data available.

Are both men and women are at risk?

BRCA mutations can occur in both males and females and in any race or ethnic group. The occurrence of mutations in the United States is about 1 in 500. However, for some ethnic groups, such as the Ashkenazi Jewish population, the risk of carrying a BRCA mutation increases to 1 in 40. *See table below.*

Risk of Cancer in Individuals Wth a BRCA1 or BRCA2 Mutation			
Cancer Type	General Population (No Mutation)	Individuals With The Mutation	
		BRCA1	BRCA2
Breast	12%	50-80%	40-70%
Ovarian	1-2%	24-40%	11-18%
Male Breast	0.10%	1-2%	5-10%
Prostate	15% (N. Europe Origin)	Up to 30%	Up to 39%
	18% (African American)		
Pancreatic	0.50%	1-3%	2-7%

BRCA 1/2 Genetics Home Reference. Available at: http://ghr.nlm.nih.gov.gene/BRCA1/ http://ghr.nlm.nih.gov.gene/BRCA2. accessed November 10, 2015

How do I reduce my risk?

If you have a family history of breast, ovarian or prostate cancer, or if you have tested positive for a genetic mutation, you may be at a higher risk for developing these cancers. Talk to your doctor about steps you can take to reduce your risk. Suggestions may include:

- Increased cancer screenings or having screenings at an earlier age than what is recommended for the general population
- Taking anti-estrogens or other medicines that block or decrease the levels of estrogen in your body
- In some cases, surgery to reduce your risk of developing cancer may be recommended

It is important to know your family history and to talk to your doctor for guidance. For more information about reducing your risk and family history details you should be aware of, please visit www.GoPathGenetics.com.

Should I get tested?

The U.S. Preventive Services Task Force (USPSTF) recommends that primary care providers offer BRCA1/2 screening for women whose family members have had breast, ovarian, tubal, or peritoneal cancer to determine whether or not their family's history indicates the possible presence of breast cancer susceptibility gene mutations (BRCA1 or BRCA2 mutations).

The USPSTF also recommends against routine genetic counseling or BRCA testing for patients whose family history does not indicate an association with an increased risk of BRCA1 and BRCA2 mutations.

Reviewing your family history with your physician is the first step in determining whether or not BRCA*now*® testing would be beneficial for you. Your physician will review your family history and risk assessment with you and, if applicable, will provide a referral to a genetic counselor for further consultation. If a determination has been made that the BRCA*now*® test is recommended based on your physician's evaluation and a genetic counselor's assessment, you will be asked to sign an Informed Consent to begin the process of genetic testing at GoPath Laboratories.

"My mom had the gene before anyone knew what BRCA was. I just feel lucky that I was able to really make the decisions I made and choose to live."

-Angelina Jolie, as quoted from the *New York Times*

Self-Evaluation Form

You may be at increased risk for a genetic mutation if your family history includes:

(Check all that applies to your family history)

- [ ] One or several relatives with breast cancer
- [ ] Any relatives with ovarian cancer
- [ ] Relatives diagnosed with breast cancer before age 50
- [ ] A relative with triple-negative breast cancer
- [ ] A relative who had both breast and ovarian cancer
- [ ] A male relative with breast cancer
- [ ] Ashkenazi Jewish ancestry (Central or Eastern European) and any relatives with breast or ovarian cancer
- [ ] Having more than one relative on the same side of the family with breast, ovarian or fallopian tube cancer, prostate cancer, pancreatic cancer or melanoma
- [ ] A relative with a known gene mutation

You may have a higher risk for a mutation if you had:

- [ ] Breast cancer before age 50
- [ ] Triple-negative breast cancer
- [ ] Male breast cancer
- [ ] Prostate cancer before age 50 and/or metastatic prostate cancer at any age
- [ ] Breast cancer more than once
- [ ] Ovarian cancer, fallopian tube cancer, or primary peritoneal (lining of the abdomen) cancer at any age
- [ ] Both breast and ovarian cancer
- [ ] Breast cancer or ovarian cancer at any age and you are of Ashkenazi Jewish ancestry (Central or Eastern European)
- [ ] Breast cancer and you also have a family member with either breast or ovarian cancer

*Take this booklet with you to your genetic counselor and physician appointments

How is the BRCA gene inherited?

BRCA1/2 mutations can be passed or inherited from a mother or a father in an autosomal dominant fashion. This means that having only one copy of a BRCA1/2 mutation can increase your chance of developing certain cancers like breast and ovarian. If your mother or father carries a BRCA mutation, you have a 50% chance of inheriting that same mutation. While not everyone who inherits the BRCA mutation develops cancer, those with the mutation are considered to be at a higher risk. If your mother or father has a BRCA mutation but you do not, you cannot pass this mutation down to your own children.

What is BRCA*now*® testing and why GoPath?

BRCA*now*® is a Next-Generation Sequencing (NGS)-based assay using a state-of-the-art platform developed exclusively at GoPath Laboratories. This means that this type of test is highly sensitive and delivers very accurate results. In addition to testing for BRCA 1/2 genes, our BRCA*now*® panels include a number of other genes that have been found to be associated with an increased risk for developing hereditary cancer.

Once you have been tested, GoPath shares the results with your physician and/or genetic counselor in preparation for your one-on-one consultation to discuss your risk, develop a preventative action plan, and plan possible additional testing.

This chart shows just some of the genes included in our BRCA*now*® Extended Comprehensive Risk Panel. More will be added as they are identified.

Will my results be kept confidential?

Yes, your genetic testing results are protected under the Genetic Information Nondiscrimination Act of 2008 (GINA), a federal law protecting people from genetic discrimination in health insurance and employment. Before testing, GoPath will also provide you with an Informed Consent form elaborating on these rights. This form must be signed prior to any genetic testing performed at GoPath Laboratories.

Genetic testing provides you with information to help you understand the health conditions that run in your family along with the potential risk for developing diseases like cancer. It is absolutely your choice to seek genetic testing and counseling to learn about any health risks without fear of discrimination and GINA protects you from that.

It is against the law for health insurers to request, require, or use a person's genetic testing history to make decisions about insurance eligibility, premium amount, or coverage terms. Although insurers may need to ask for genetic testing information to help approve a coverage determination, they cannot use the information to discriminate against you.
It is also illegal for employers to use genetic information to make hiring, firing, promotion, or pay rate decisions or to limit, segregate, classify, or mistreat an employee in any way. (Note: GINA does not apply to employers with 15 or fewer employees).

For more information, please refer to one of the following GINA information websites:

A Guide to the Genetic Information Nondiscrimination Act (GINA) - http://www.geneticfairness.org/ginaresource.html

GINA Resources from the Genetic Alliance - http://ginahelp.org

Results and Interpretation

Interpretation and classification of detected variants is an assessment that incorporates various components of cataloged information from national databases as well as from published references. Variants classified within genes are reported in the following categories in accordance to the ACMG standards and guidelines:

Positive

Positive: Positive results indicate an identified genetic alteration (mutation or deletion) that is clinically significant and is either **pathologic or likely pathogenic**, resulting in abnormal function of coded proteins. Such mutations are associated with a significantly higher risk of developing hereditary cancers.

Variant of Unknown Significance (VUS)

Variant of Unknown Significance (VUS): The variants have unknown effects on gene function, have not been previously reported or have been reported with inadequate or conflicting evidence regarding pathogenicity. The genetic change has not been scientifically linked to being an increased risk and may also be a normal variant not associated with an increased risk of developing hereditary cancers.

Negative

Negative: The variants have sufficient reported evidence and observation to be considered of no clinical significance. The changes are classified as **benign** (harmless) and confer no risk associated with cancer. A negative test result could also be considered **likely benign**. This means the variants are strongly suggestive of having no effect on the gene function and are unlikely to have an increased risk for developing hereditary cancers.

Your physician or genetic counselor will help you understand the significance of each category. If there is a strong family history of ovarian or breast cancer, other family members may also be tested by GoPath Laboratories.

Results Ready
10-14
Business Days

What if my test is positive?

What are your options and next steps if your test is positive? If your test is positive for a BRCA mutation or another rare gene associated with breast and ovarian cancer, your physician and a genetic counselor will discuss several options to help reduce your risk for developing cancer. These options may include: increased or enhanced screenings, proactive surgery, or drug therapy.

Should my family get tested? If your test is positive, your family members need to be tested. They too should discuss the importance of testing with a genetic counselor. Testing your family members is simpler and less costly than initial testing because only a single, identified gene mutation needs to be tested.

Genetic counseling for BRCA*now*®

Your physician or a genetic counselor will discuss your personal risk of BRCA1/2 mutations and give you time to visit the GoPathGenetics.com website if the BRCA*now*® test is recommended for you. Your physician is equipped with the knowledge and understanding to help lead you in the right direction, but in the end, it is still your decision whether or not to have genetic testing.

A genetic counselor will schedule a convenient time to discuss your medical and family history and to talk about whether BRCA*now*® is the right choice for you and/or other family members. A genetic counselor is a heath care professional who has an advanced degree in human genetics and/or genetic counseling who also has a deep understanding of the concerns and uncertainty you may have regarding genetic testing. By using educational materials and simple terms regarding your family history, you will receive an assessment and testing options. The relationship built with a genetic counselor is an important part of making the right decision for you.

How does genetic counseling work?

A genetic counselor will schedule a time to meet with you and your family members by phone and/or a web-based program to walk you through a series of questions regarding your medical and family history, previous cancer screenings, and to help you construct a complete family tree and risk assessment.
At the end of the session, the genetic counselor will:

- Share the risk evaluation results and your potential for being a BRCA1/2 mutation carrier
- Recommend genetic testing options
- Walk you through the BRCA*now*® testing process
- Offer information on cancer screening options and cancer risk prevention measures
- Develop a management plan with your physician

After the appointment is over, a genetic counselor will review any questions you have and discuss next steps. Moving forward with genetic testing is a personal choice and it's entirely your decision. Genetic counselors are experts who can help you navigate the decision process and at the end of the session will provide you with an educational packet for you to keep. Should you decide to move forward with BRCA*now*® testing, a genetic counselor will provide a risk assessment and recommendation to your physician. GoPath's preauthorization team will begin the process and work with your physician's office. Our goal is to make your genetic testing decision experience as convenient and as easy to understand as possible.

How can I pay for the BRCA*now*® test?

GoPath Laboratories accepts all commercial insurances. However, in some cases, your insurance plan may require pre-authorization or even a referral. GoPath will review the insurance information provided and submit a pre-authorization request prior to testing to ensure coverage along with the amount (if any) you would be responsible for based on non-coverage, or any deductible and copay amount.

Does GoPath offer financial assistance if I don't have insurance?

If you do not have insurance or if your insurance does not cover the BRCA*now*® test, GoPath offers a financial assistance program including discounted pricing and payment plans in accordance with our compliance program and legal guidelines. Please contact our GoPath financial team at 1-855-GoPath9 or 1-855-467-2849.

Getting started

If your physician and genetic counselor recommend moving forward with BRCA*now*® testing through GoPath Laboratories, these are the steps you would need to take: educate yourself on what to do with your results, speak to a genetic counselor to confirm your decision and complete the pre-authorization process to begin testing.

Contact Us

- Call GoPath Laboratories at 855.467.2849
- Email us at BRCAnow@GoPathLabs.com
- Request an appointment online at: http://www.gopathgenetics.com/schedule-a-genetic-counselor.html

For further information, email our pre-authorization team at:

BRCA*now*@gopathlabs.com or call 1-855-GoPath9

GeneticsNow™

It's Your Decision

ABOUT GOPATH LABORATORIES:

GoPath Laboratories, LLC, is a fully-equipped, Molecular and Genetics testing laboratory located in the north suburbs of Chicago, Illinois. We provide diagnostic and prognostic testing for a variety of cancer types.

LEARN MORE AT:

www.GoPathGenetics.com

GoPath Laboratories, LLC
1351 Barclay Boulevard, Buffalo Grove, IL 60089
Toll Free: 1-855-GOPATH9 (1-855-467-2849)
Fax: 224-588-9941
E-Mail: BRCAnow@gopathlabs.com
www.GoPathGenetics.com
www.GoPathLabs.com

GOPATH®
LABORATORIES
Global Pathology Services