BRCAssure® *Comprehensive*

Positive for a likely pathogenic variant in *BRCA2*

Following hereditary cancer screening, patients often have many questions. This guide can help you better understand your test results and possible courses of action.

Your BRCAssure test result

Recently, a sample of your blood was tested for the presence of changes (variants, which are also referred to as mutations if they are associated with genetic disease) in the *BRCA1* and *BRCA2* (breast cancer 1 and 2) genes. Certain variants in these genes are linked to an increased risk of breast cancer in both women and men, ovarian cancer, and other cancers. These variants can be passed down through a family, so the cancers they cause tend to occur in several members of the same family—a condition known as hereditary breast and ovarian cancer syndrome (HBOC).

After discussing your personal/family history and genetic testing options with you, your health care provider ordered the BRCAssure *Comprehensive* test. This test looks for all known cancer-related variants in the *BRCA1* and *BRCA2* genes. It was ordered because your personal and/or family medical history shows that you may be at high risk for HBOC.

Your BRCAssure *Comprehensive* test result shows that a likely pathogenic variant (positive result) was found in *BRCA2*.

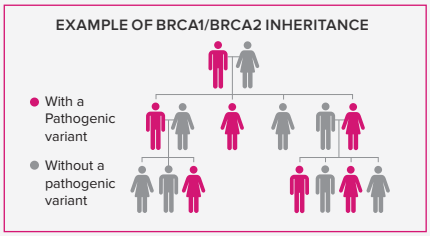
RISK OF CANCER IN INDIVIDUALS WITH A *BRCA2* PATHOGENIC VARIANT[1**]

Cancer Type	General Population (no variant)	Individuals with *BRCA2* Variant
Breast	12%	38%-84%
Ovarian	1-2%	16.5%-27%
Male Breast	0.1%	Up to 8.9%
Prostate	6% through age 69	15% by age 65; 20% lifetime
Pancreatic	0.5%	2%-7%

** Adapted from Petrucelli, N et al. *BRCA1*- and *BRCA2*-Associated Hereditary breast and Ovarian Cancer. *Gene Reviews*

What does your test result mean?

Your positive BRCAssure *Comprehensive* test result by itself does not mean that you have cancer or will develop cancer. Your positive test result means that you have a variant in *BRCA2*, which is likely to contribute to the development of disease and likely to increase your risk of getting certain cancers. It is important to know that not every person with a likely pathogenic variant develops cancer. For example, some *BRCA1*- or *BRCA2*-positive women will never develop breast or ovarian cancer.[2]



Your positive test result could also have important health implications for your family members. Genetic tests reveal information not only about you, but also about your relatives.[2] You would have inherited this variant from your mother or your father, and therefore your relatives are at risk for carrying a *BRCA2* mutation. There is also a 50% chance that you will pass this variant on to your children.[2] It can be helpful to discuss this test result with your family members so they too can decide if genetic testing is right for them.

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What actions are recommended based on these test results?

As your BRCAssure *Comprehensive* test result was positive for a likely pathogenic variant in *BRCA2*, you should work with your doctor or genetic healthcare provider to guide you in deciding what steps to take to manage your health.

There are several options that you and your doctor could consider to reduce the risk of getting cancer. Options for reducing cancer risk are available, whether or not you have had a cancer diagnosis. Options discussed with you may include, but are not limited to: being screened for certain cancers more often by your doctor (possibly with different tests than used before); surgery that may decrease your cancer risk; and/or medications that have been shown to lower cancer risks in some people. Consult your health care provider for recommendations specific to you.

Enhanced cancer screening

Enhanced cancer screening may be able to detect breast cancer at an early stage. Some women who test positive for *BRCA1* and/or *BRCA2* mutations may choose to begin cancer screening at an earlier age than the general population or may choose to have screenings more often.[2] Screenings may include monthly breast self-exams and clinical breast exams performed by your doctor. Both mammography and MRI (imaging techniques) may also be used to identify breast cancer[3] and the *American Cancer Society* (ACS)[4] and the *National Comprehensive Cancer Network®* (NCCN) recommend yearly screening with these methods for high-risk women.[3]

For ovarian cancer screening, there is no recommended path from a professional or governmental society. You and your doctor may feel that performing pelvic exams, transvaginal ultrasound (an imaging technique that uses a hand-held device inserted into the vagina to take pictures of your reproductive organs), or testing for CA-125 levels (a blood test) would assist with your management of your cancer risk.[2]

BRCA1- and/or *BRCA2*-positive men should discuss monthly breast self-exams, clinical breast exams, and mammography with their doctor. In addition, these men should also follow current *NCCN Guidelines®* for prostate cancer.[3]

Preventive or prophylactic (risk-reducing) surgery[2]

Prophylactic surgery works to remove as much of the at-risk tissue as possible. Even though this prophylactic surgery does not guarantee that you will not get cancer, research studies have shown that it significantly reduces the risk of dying from ovarian or breast cancer. In women with *BRCA1* or *BRCA2* mutations, a bilateral prophylactic mastectomy (removal of breasts) reduces the risk of breast cancer and removing the ovaries and fallopian tubes (bilateral salpingo-oophorectomy) reduces the risk of ovarian cancer. The removal of the ovaries and fallopian tubes may also reduce the risk of breast cancer in premenopausal women with a *BRCA1* or *BRCA2* mutation by reducing the amount of estrogen that is produced.

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Risk-reducing medications (chemoprevention)

Chemoprevention or taking certain drugs may reduce your risk of breast cancer. For example, in women with *BRCA1* or *BRCA2* mutations, certain drugs have been shown to reduce the risk of breast cancer and/or may also reduce the risk of ovarian cancer.[2]

You may wish to talk to your doctor or genetic healthcare provider about how to discuss your test result with close blood relatives who may be at risk for HBOC. Also, it is important that you update your doctor on any changes to your family's cancer history. This will help your doctor to manage your cancer risks appropriately.

In addition, research studies are being conducted to find new and better ways to treat and prevent cancer in people who carry mutations in *BRCA1* or *BRCA2*. There are many clinical trials also open to individuals with *BRCA1* or *BRCA2* mutations.[2] It is important to discuss your options with your doctor and/or genetic healthcare provider to understand which option(s) is best for you.

Genetic Counseling

Genetic counselors translate and communicate genetic information into practical, understandable terms. They can help you understand the implications of your test results, and support you in making thoughtful genetic health care decisions for you and your family. If you would like to further understand your test results, please speak with your doctor or genetic healthcare provider about genetic counseling or visit **www.integratedgenetics.com.**

ADDITIONAL RESOURCES

- *American Cancer Society* website: www.cancer.org
- *American College of Obstetricians and Gynecologists* (ACOG) website: www.acog.org/patients and *American College of Obstetricians and Gynecologists*; *ACOG Committee on Practice Bulletins*–Gynecology; *ACOG Committee on Genetics*; *Society of Gynecologic Oncologists*. *ACOG Practice Bulletin No. 103*: Hereditary breast and ovarian cancer syndrome. *Obstetrics and Gynecology*. 2009;113(4):957-966.
- *Facing Our Risk of Cancer Empowered* (FORCE) website: www.facingourrisk.org
- *National Cancer Institute* website: www.cancer.gov

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