

What are BRCA1 and BRCA2?

Our bodies are made up of trillions of cells. Each cell contains DNA (deoxyribonucleic acid), which holds all the information needed for a cell to function. DNA is grouped into units called “genes” that are passed down from parents to their children. Genes act as instructions for what we look like and how we develop, and can protect us against disease. Some changes or *mutations* in your genes can increase your risk of developing certain diseases, including cancer.

Usually obtained via blood, samples of a person's DNA can be analyzed to look for mutations in genes, like BRCA1 and BRCA2, that increase the chance of developing certain types of cancer. People with BRCA1 and BRCA2 mutations are more likely to develop cancer at a younger age and have high grade (aggressive) tumours.

People with BRCA1 and BRCA2 mutations are known to have an increased risk of the following types of cancer:¹

- Breast
- Ovarian, fallopian tube, and/or peritoneal (lining of the abdomen and organs)
- Prostate
- Pancreatic
- Melanoma

5-10% & **~15%**
of breast cancer cases of ovarian cancer cases
are associated with a mutation in a cancer predisposition gene.¹

In all ethnic populations, the most common forms of hereditary breast and ovarian cancer result from a mutation in either the BRCA1 or BRCA2 gene.²



IS BRCA1 AND BRCA2 TESTING COVERED BY MY PROVINCIAL HEALTH PLAN ?



If you are considered at high risk for having BRCA1 or BRCA2 mutations, you may qualify for funding from the Ministry of Health for genetic counselling and testing. Your doctor can refer you to a local cancer genetics clinic, which can be found through www.cagc-accg.ca.

Contact a genetics professional for more information.

Contact your doctor or a genetics professional to learn more about BRCA1 and BRCA2, and to answer any questions you may have about genetic testing.

Visit www.lifelabsgenetics.com to find out more about getting tested for BRCA1 and BRCA2.

Ask.Genetics@LifeLabs.com
www.lifelabsgenetics.com | 1-844-363-4357

References: 1. Claus EB, et al. The genetic attributable risk of breast and ovarian cancer. *Cancer*. 1996;77(11):2318-2324. 2. Hall MJ, et al. BRCA1 and BRCA2 mutations in women of different ethnicities undergoing testing for hereditary breast-ovarian cancer. *Cancer*. 2009;115(10):2222-2233. 3. Petrucelli N, et al. *BRCA1- and BRCA2-Associated Hereditary Breast and Ovarian Cancer*. In: Pagon RA, Adam MP, Ardinger HH, et al., eds. *GeneReviews*[®]. Seattle (WA); 1993. 4. Morgan RJ, Jr, et al. Ovarian Cancer, Version 1.2016, NCCN Clinical Practice Guidelines in Oncology. *J Natl Compr Canc Netw*. 2016;14(9):1134-1163. 5. National Cancer Institute. BRCA1 and BRCA2: Cancer Risk and Genetic Testing. 2015. Available at: <https://www.cancer.gov/about-cancer/causes-prevention/genetics/brca-fact-sheet>. Retrieved February 22, 2017. 6. American College of Obstetricians and Gynecologists. *Hereditary Cancer Syndromes and Risk Assessment*. June, 2015. 7. Whittemore AS, et al. Prevalence of BRCA1 mutation carriers among U.S. non-Hispanic Whites. *Cancer Epidemiol Biomarkers Prev*. 2004;13(12):2078-2083.

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Understand your risk: Make informed decisions about hereditary breast and ovarian cancer



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Why should I be tested for BRCA1 and BRCA2 mutations?

Knowing whether you have a mutation in the BRCA1 or BRCA2 genes can:

- Help you to make informed decisions about your body and health
- Reduce serious consequences that can result from cancer
- Benefit and inform family members, as the mutation could be present in close relatives, including children

Children and siblings of people with a BRCA1 or BRCA2 mutation have a 50% chance of inheriting the mutation.³

What is genetic counselling and how can it benefit me?

The results of genetic tests can have an emotional impact, and may reveal sensitive information about your health or the health of someone else in your family. Genetic counselling can help you understand the possible impacts of genetic testing results and whether testing is right for you. A genetic counsellor will discuss the following topics with you, in a pre-test counselling session:

- Review your family history of cancer
- Discuss the benefits, limitations, and risks of genetic testing
- Help you understand the possible results of genetic testing
- Discuss the possible impact it may have on your insurance
- Help you prepare for the impact the results may have on you and your family

Resources for healthcare providers and patients

- LifeLabs geneticists and genetic counsellors: <http://www.lifelabsgenetics.com>
- Find a genetics clinic: <http://www.cagc-accg.ca>
- Hereditary Breast and Ovarian Cancer Society: <http://hbocsociety.org>
- Ovarian Cancer Canada: <http://www.ovariancanada.org>
- Willow: Breast and Hereditary Cancer Support: <http://www.willow.org>
- HBCO on GeneReviews®: <http://www.ncbi.nlm.nih.gov/books/NBK1247>
- Canadian Cancer Society: <http://www.cancer.ca>
- Rethink Breast Cancer <https://rethinkbreastcancer.com/>

How do I get the BRCA1 and BRCA2 tests?



- 1. Discuss the test with your doctor**
 - Read the Patient Information sheet and sign the consent form
 - Have your doctor sign a requisition



- 2. Give your sample**
 - Simple blood or saliva samples can be collected at a LifeLabs® location or your home



- 3. Talk to a genetic counsellor**
 - A 15 - 30 minute genetic counselling session (via telephone or Skype™) will be scheduled once LifeLabs Genetics receives your sample
 - You and your doctor will receive a written summary of the session



- 4. BRCA1 and BRCA2 analysis**
 - Our German laboratory partner, Centogene, will analyze your sample



- 5. Receive your results**
 - Within 4 - 6 weeks, the results and a letter of explanation will be sent to your doctor
 - You will be notified that your results are ready for review



- 6. Discuss your results with a genetic counsellor**
 - You are strongly encouraged to contact LifeLabs Genetics for post-test genetic counselling

Who should be tested for BRCA1 and BRCA2 mutations?

Between 1 in 300 to 1 in 500 people are estimated to have a BRCA1 or BRCA2 mutation.⁴

PEOPLE AT HIGHER RISK OF HAVING A BRCA1 OR BRCA2 MUTATION INCLUDE:^{5,6}



- Women with breast cancer diagnosed at age 50 or younger
- Relatives of people who have a BRCA1 or BRCA2 mutation
- Women who have had multiple primary breast cancers



- People of Ashkenazi Jewish ancestry with a history of breast, ovarian, or pancreatic cancer
- People with two or more relatives with breast cancer, one under age 50
- People with three or more relatives with breast, ovarian, pancreatic, and/or aggressive prostate cancer



- Women with ovarian cancer, fallopian tube, or primary peritoneal cancer
- Women with both breast and ovarian cancer
- Males with breast cancer at any age
- People with pancreatic cancer who have also had breast or ovarian cancer in the same individual or on the same side of the family

Some individuals who do not meet the “high risk” criteria above may still choose to pursue BRCA1 and BRCA2 genetic testing.

20-50% of individuals with BRCA1 or BRCA2 mutations have no reported family history of breast and/or ovarian cancer.⁷

LifeLabs Genetics offers genetic counselling information sessions for individuals getting tested for BRCA1 and BRCA2.