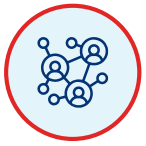
BASSER CENTER FOR BRCA

BRCA1 AND *BRCA2* GENE MUTATIONS IN THE ASHKENAZI JEWISH COMMUNITY



EVERYONE HAS *BRCA1* AND *BRCA2* GENES.

These genes make proteins that help repair damage to DNA within cells. Individuals who inherit a mutation in their *BRCA1* or *BRCA2* genes means that their cells are less able to repair damage, increasing their risk for certain cancers, including breast (female and male), ovarian, pancreatic, prostate and melanoma cancers. There are options available to reduce and manage these cancer risks.

ELEVATED RISKS FOR INDIVIDUALS OF ASHKENAZI JEWISH ANCESTRY.

Individuals of Ashkenazi Jewish (Central or Eastern European) ancestry have a **1 in 40** chance of carrying a *BRCA1* or *BRCA2* gene mutation, compared to 1 in 200 people in the general population. Many Ashkenazi Jewish women and men are not aware that they have a BRCA gene mutation. A personal and/or family history of breast, ovarian, high-grade prostate or pancreatic cancers on the mother's or father's side of the family may be a sign of a hereditary gene mutation.

BOTH MEN AND WOMEN CAN INHERIT A BRCA GENE MUTATION.

Women who have a *BRCA1* or *BRCA2* gene mutation have up to a 75% lifetime risk of developing breast cancer and up to a 50% lifetime risk of developing ovarian cancer. A personalized cancer risk management plan for women can include increased and earlier screenings (such as breast MRI and mammogram), consideration of risk-reducing surgeries, and chemoprevention (taking a medication shown to lower the chance of developing cancer).

Men who have *BRCA1* or *BRCA2* gene mutations have up to a 25% lifetime risk of developing prostate cancer and up to a 7% lifetime risk for developing male breast cancer. While cancer risks in male BRCA carriers are not as dramatically elevated as those of female BRCA carriers, cancer risk management and early detection are crucial. Medical management for men with a BRCA mutation may include clinical breast exams, mammograms and earlier prostate cancer screenings.

Both male and female BRCA gene mutation carriers are at risk for pancreatic cancer and melanoma. In patients already diagnosed with cancer, knowing about a BRCA mutation may provide the opportunity for novel therapies or clinical trials.

Scan the QR code with your mobile to learn more about BRCA in the Jewish Population or visit www.basser.org/brca/brca-ashkenazi-jewish-community

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FREQUENTLY ASKED QUESTIONS ABOUT *BRCA1* or *BRCA2* GENE MUTATIONS.

Are you at high risk?

Family history is important to determine who is at the highest risk for carrying a *BRCA1* or *BRCA2* gene mutation (also known as a pathogenic variant). Women and men of Ashkenazi Jewish ancestry at highest risk for carrying a BRCA mutation are recommended to speak with a genetic specialist, should any of the following apply:

- A diagnosis of breast cancer (male or female), ovarian cancer, pancreatic cancer or high-grade prostate cancer at any age.
- A family history of breast, ovarian, pancreatic, or high-grade prostate cancer.
- A known mutation in a cancer risk gene in a family member.

Regardless of personal and family history of cancer, individuals with Ashkenazi Jewish ancestry can still consider genetic evaluation related to *BRCA1* and *BRCA2*. We recommend speaking to a genetic specialist to discuss individualized risk assessment.

What family history information is needed before meeting with a genetics professional?

Collect a detailed family history of cancer from blood-relatives on both your mother's and father's side of the family. This includes, first degree (parents, siblings, children), second degree (half-siblings, grandparents, aunts and uncles) and third degree (cousins, great grandparents, great-aunts, great-uncles) relatives. It is important to know the types of cancer your relatives have had and the ages when they were diagnosed.

How common are *BRCA1* or *BRCA2* gene mutations?

BRCA gene mutations occur in all races and ethnicities. Individuals of Ashkenazi Jewish descent have a 1 in 40 chance of having a *BRCA1* or *BRCA2* gene mutation as compared to about 1 in 200 individuals in the general population.

Can women and men have *BRCA1* or *BRCA2* gene mutations?

Both women **and** men can inherit *BRCA1* or *BRCA2* gene mutations and pass them on to their female and male children.

What is the chance of passing on or inheriting a *BRCA1* or *BRCA2* gene mutation?

If a mother or father has a mutation, there is a 50% chance of passing it on to each child.

What is the cost of *BRCA1* or *BRCA2* genetic testing and does insurance cover it?

Genetic testing costs are not as high as in the past. When meeting with a genetic specialist, a testing plan will be made. The cost of the test can vary between laboratories and costs are often covered, either in part or in full, by insurance carriers when an individual meets certain testing criteria. Currently, Medicare covers genetic testing for individuals with a personal history of cancer, but not for unaffected individuals. Medicaid coverage varies by state.

What if an individual does not have insurance, or cannot afford *BRCA1* or *BRCA2* genetic testing?

Some medical centers and testing labs have financial assistance programs to assist uninsured and underinsured individuals with the cost of their genetic testing.

Will a *BRCA1* or *BRCA2* genetic test result interfere with getting health insurance

The Genetic Information Nondiscrimination Act (GINA) currently prevents employers and health insurance companies from using genetic information to discriminate against individuals based on this information. However, GINA does not extend to life, disability or long-term care insurance and people may choose to consider their coverage before undergoing genetic testing.

Are mutations in *BRCA1* or *BRCA2* genes the only ones that impact cancer risk?

Although mutations in the *BRCA1* or *BRCA2* gene genes are important predictors of cancer risk, they are not the only gene mutations that can increase risk. An individualized risk assessment by a cancer genetics professional can help to determine if testing for other gene mutations is recommended.

Additional Information and how to find a local genetic counselor.

Visit **basser.org** or call the Basser Center for *BRCA* at Penn Medicine at **215.662.2748**.

The National Society of Genetic Counselors (**www.nsgc.org**) is a helpful resource for finding local genetics professionals.

WE TAKE CANCER PERSONALLY.

basser.org

From the **Basser Center for BRCA** in collaboration with:

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