

About Genes

Genes are in every cell in our bodies. Genes are made of DNA, which tells cells how to grow and work together. We have two copies of each gene in each cell—one from our mother and one from our father. When genes work right, they help stop cancer from developing. Sometimes changes to a gene can happen. These changes are called mutations. Mutations can make genes stop working, which raises the risk for certain cancers.

A mutation in the *BRCA1* or *BRCA2* genes raises the risk of breast and ovarian cancers in women and breast and prostate cancers in men.

BRCA1/BRCA2 Mutations and Cancer Risk

WOMEN

About 10 in 100 women get breast cancer during their life. This risk increases to 50-85 people in 100 with a *BRCA1* or *BRCA2* gene mutation. Women with a *BRCA1/BRCA2* mutation who already had breast cancer have an increased risk above the general population of getting a second, new breast cancer.

The average lifetime risk for ovarian cancer in women is 1 in 100. The lifetime ovarian cancer risk is 40-60 in 100 for women with a *BRCA1* mutation and 20-30 in 100 for women with a *BRCA2* mutation.

MEN

Male breast cancer is usually very rare—fewer than 1 in 100 men will get it. Men with a *BRCA1* mutation have a slightly higher lifetime risk of breast cancer above the general population, and men with a *BRCA2* mutation have a 6-8 in 100 lifetime breast cancer risk. Prostate cancer is more common. About 15 in 100 men will get it. People with a *BRCA1* mutation have a slightly higher lifetime risk, and men with a *BRCA2* mutation have a 20-30 in 100 risk of prostate cancer. They may also be at risk for a more aggressive form of prostate cancer.

WOMEN AND MEN

People with *BRCA2* mutations also have higher risks for melanoma (a type of skin cancer) and pancreatic cancers. The lifetime risks are 2 in 100 for melanoma and 5-7 in 100 for pancreatic cancer. At this time, screenings for melanoma and pancreatic cancers are the same for people with *BRCA1/BRCA2* mutations as the general population, unless a person has a family history of these cancers.

Recommendations

WOMEN

- Starting at age 25: Breast exam by a doctor two times a year
- Between ages 25 and 30: Breast MRI every year
- Starting at age 30: Mammogram and breast MRI every year, switching exams every 6 months
- After age 35: Surgery to remove ovaries and fallopian tubes, if no plans to be pregnant

Women may consider taking medicine to reduce their risk of getting breast cancer. They may also consider surgery to remove both breasts (bilateral mastectomy) to reduce their risk as much as possible.

It is important to talk with your doctor about what is best for you based on your medical and family history.

MEN

- Starting at age 35: Breast exam by a doctor every year
- Starting at age 40: Prostate cancer screening recommended for men with *BRCA2* mutation, and considered for men with *BRCA1* mutation

KIDS AND SIBLINGS

Siblings and children of people with a *BRCA1* or *BRCA2* mutation have a 50% chance of also having it. Genetic testing and counseling are recommended after age 18.

Family Members Who Test Negative

Family members who do not have the *BRCA1* or *BRCA2* mutation usually have the same level of risk for breast, ovarian, prostate, melanoma, and pancreatic cancers as the general population if they do not have other risk factors. They should follow general cancer screening guidelines.

Resources

If you have a personal or family history of breast or ovarian cancer, you may be eligible for genetic testing and counseling. Please contact Huntsman Cancer Institute's Family Cancer Assessment Clinic to learn more: **801-587-9555** or huntsmancancer.org/fcac

If you already know you or a family member has a *BRCA* or other gene mutation, our team of doctors and genetic counselors can help you with a cancer screening plan.