

Nine common questions about genetic testing for cancer

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Your genes play a role in nearly all areas of your health. A gene is like an instruction manual for your body that tells your body how to function, develop and stay healthy. People have about 20,000 genes in their bodies.

"Many [health conditions](#) have a genetic link," says Breanna Mitchell, a genetic counselor at Mayo Clinic Health System in Eau Claire. "Genetic testing can help you and your health care team understand if you have an increased risk for developing certain conditions that are present in your family. If you are at risk, you may be able to take preventive measures to decrease your risk or undergo genetic testing to clarify your risk."

Here are nine common questions about genetic testing:

Do all types of cancers have a genetic component?

Most cancers are considered sporadic, meaning the cancer happens randomly or has environmental influences, such as smoking and [lung cancer](#). About 25% of cancers are considered familial. This is when multiple members of a family are affected by cancer. These family members have some shared genetic factors in combination with shared environmental factors that lead to the development of these cancers.

"About 10% of cancers are considered hereditary or have a single specific [genetic component](#) that can be tested and increase a person's risk for developing cancer," Mitchell says. "Genetic counseling and genetic testing can help determine which category a person's individual or family cancer falls into. It also can help estimate your risk for developing cancer."

What types of genes are examined during genetic testing?

You may have an increased risk for some health conditions, including some types of cancer, based on your [genes](#). A genetic test looks for specific harmful gene changes, called mutations or pathogenic variants, that can cause you to develop a genetic condition. Gene changes are like spelling errors within your body's instruction manual.

Most genetic tests look for changes in a group of genes called a panel. However, testing may look for changes in a [single gene](#) when there is a known genetic mutation in your family. The most common genes typically thought of related to cancer risk are BRCA1 and BRCA2. These genes are associated with breast and ovarian cancer. It's known that changes in other genes can increase risk for these cancers, as well.

There also are gene panels that assess risk for other cancers, such as colorectal, pancreatic, prostate, liver, uterine and endometrial cancers.

Am I guaranteed to get cancer if I have a known gene?

No. Inheriting a harmful gene change means that you have an increased risk for cancer, but it does not guarantee that you will develop a cancer in your lifetime.

"If testing shows that you have an increased risk for cancer, you may need to be screened earlier or more often," Mitchell says. "For example, if you have a change in the BRCA gene that increases your risk for breast cancer, your care team will recommend that you have mammogram or MRI breast screenings beginning at a younger age or more frequently. The genetic counselor will explain your associated

cancer risks and screening recommendations based on your genetic test results."

What criteria do I need to meet to have genetic testing completed?

Your health care team may recommend genetic testing based on guidelines established by the National Comprehensive Cancer Network (NCCN). These guidelines use factors such as your personal cancer history, family cancer history, ancestry or the presence of abnormal cells to determine if you qualify for genetic testing.

If you do not meet the NCCN guidelines, you can still pursue testing. Your [health insurance](#) may not cover any or all of the testing costs, so more out-of-pocket expenses to be tested are possible.

Can genetic testing help during cancer treatment?

If you are battling cancer, genetic testing can help your care team make recommendations for treatments and surgical procedures. For example, some cancers associated with genetic mutations respond better to certain types of chemotherapy treatments. Similarly, genetic testing can help you determine between a lumpectomy or a mastectomy when making surgical decisions about breast cancer. It also can affect the management of cancer risk over time.

"The results also can help other family members," Mitchell says.

"Potentially, your children, siblings, nieces and nephews could have inherited the same gene mutation. Knowing this information can help them establish early screening schedules and make healthy decisions about their lives."

How can I prepare for a genetic testing consultation?

Gathering a detailed family health history is the most important thing to prepare for a genetic counseling appointment. Try to gather information about relatives, including types of cancer diagnosed, age of diagnosis, current age or age at death. Also find out if any relatives have perviously had genetic testing completed.

If no previous [genetic testing](#) has been performed, often the best person to be tested is the family member with cancer. That person is most likely to have a genetic change if there is one. If an affected family member is unavailable for testing due to death or lack of interest, an unaffected person can still be tested.

"Something else to think about before your consultation is the purpose of your test," Mitchell says. "Younger patients usually want to know their personal risk so they can do extra screening. Older patients who are cancer survivors may wish to gather information and share it with downstream [family members](#) so they are aware of harmful genetic changes they could have potentially inherited."

Am I only able to get cancer if I have the BRCA gene or one of these other genes?

A common misconception is that you have one of these genes or you don't. Everyone has the BRCA genes and these other genes associated with [cancer risk](#). The role these genes play in the body is to prevent cancer from occurring.

It's when a harmful change occurs in one of these genes that causes it not to work like it should. This leads to the increased risk for cancer to develop.

People without these harmful changes can still develop cancer, but the risk is not as high as someone who has a hereditary predisposition.

Am I more likely to inherit something from a parent of the same sex as me? Or the parent that I most resemble?

No. Every person has two copies of every gene—one copy inherited from each parent. If a parent has a harmful genetic change in one copy of a gene, it is random which copy they will pass on to children.

Every child has a 50-50 chance of inheriting the typical copy or the changed copy, regardless of you or your parent's biological sex, or whether you more closely resemble one side of the family.

There is breast cancer on my dad's side of the family, I'm not at risk because my dad can't pass that on, right?

People often think that a heritable risk for some cancers, such as breast and ovarian cancer, can't be passed on from males. This is not true.

All people, regardless of biological sex, can carry a heritable risk factor for any type of [cancer](#) and can pass it on to any of their children.

"While you can't change your genes, you can control some aspects of your environment, such as diet and physical activity level, as well as alcohol and tobacco use," Mitchell says. "That's why it's still so important to live a healthy life, regardless of your personal and family genetic history."

Provided by Mayo Clinic

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