Quest Advanced® Oncology

Moving forward starts with **KNOWING**

Genetic testing for hereditary cancer

A patient support guide

Does cancer run in **your family?**

Cancer is more common in some families. Sometimes cancer is caused by a change in a gene, called a variant.

About 5% to 10% of the time, these cancers run in families. This is called hereditary cancer. Hereditary cancer can be passed down from parent to child. People who have an inherited variant have a higher risk of developing cancer than people who do not have a variant.

Review this guide with your doctor to learn if one of these tests is right for you.

Some words in this guide are highlighted, **like this**. You will find the definitions in the back of the brochure under **Important terms to know**.

How can genetic testing for hereditary cancer help?

A **genetic** test is available to help you find out if you have a **variant**. It can help you and your doctor learn more about your cancer risk. If the test finds a variant, you have options to lower your risk for cancer.

Getting tested can also give important information to your family. It can help your family members understand *their* risk for cancer.

Who should consider testing?

Talk with your doctor about testing if any of the statements below are true about you or someone in your family:

- Have had cancer diagnosed under age 50
- Have had 2 or more cancers diagnosed in the same person
- Have had 2 or more family members (on the same side of the family) diagnosed with cancer
- Have been diagnosed with a rare cancer
- Have a relative who has tested positive for a cancer **gene** variant

Which test is right for me?

Talk to your doctor to decide which test may be best for you. The right test depends on many factors. Tell your doctor if anyone in your family has had genetic testing or a positive genetic test.

Tests available from Quest Diagnostics®

For the complete test offering, go to **QuestHereditaryCancer.com** or ask your doctor.

Test name	Description
Comprehensive Hereditary Cancer Panel (66 genes)	Multi-cancer 66 gene panel tests for variants in these genes: *APC, ATM, AXIN2, BAP1, BARD1, BLM, BMPR1A, BRCA1, BRCA2, BRIP1, CDH1, CDK4, CDKN1B, CDKN2A, CHEK2, DICER1, EGFR, EPCAM, FANCA, FANCC, FANCM, FH, FLCN, GALNT12, GREM1, HOXB13, MAX, MEN1, MET, MITF, MLH1, MRE11 (MRE11A), MSH2, MSH3, MSH6, MUTYH, NBN, NF1, NTHL1, PALB2, PMS2, POLD1, POLE, POT1, PTCH1, PTEN, RAD50, RAD51C, RAD51D, RECQL, RET, SDHA, SDHAF2, SDHB, SDHC, SDHD, SMAD4, SMARCA4, STK11, SUFU, TMEM127, TP53, TSC1, TSC2, VHL, XRCC2*
Guideline-Based Hereditary Cancer Panel (32 genes)	Multi-cancer 32 gene panel tests for variants in these genes: *APC, ATM, AXIN2, BARD1, BMPR1A, BRCA1, BRCA2, BRIP1, CDH1, CDK4, CDKN2A* (p16,p14), *CHEK2, EPCAM, GREM1, HOXB13, MLH1, MSH2, MSH3, MSH6, MUTYH, NF1, NTHL1, PALB2, POLD1, POLE, PMS2, PTEN, RAD51C, RAD51D, SMAD4, STK11, TP53*
Hereditary Colorectal Cancer Panel (20 genes)	Tests for variants in 20 genes associated with increased risk for colorectal cancer including: *APC, AXIN2, BMPR1A, CDH1, CHEK2, EPCAM, GREM1, MLH1, MSH2, MSH3, MSH6, MUTYH, NTHL1, PMS2, POLD1, POLE, PTEN, SMAD4, STK11, TP53*
Hereditary Breast Cancer Panel (18 genes)	Tests for variants in 18 genes predominantly associated with breast, prostate cancer, and other tissues including these genes: *ATM, BARD1, BRCA1, BRCA2, CDH1, CHEK2, EPCAM, MLH1, MSH2, MSH6, NF1, PALB2, PMS2, PTEN, RAD51C, RAD51D, STK11, TP53*
Hereditary Endocrine Cancer Panel (12 genes)	Tests for variants in 12 genes associated with increased risk for paragangliomas, pheochromocytomas, and endocrine cancer: *FH, MAX, MEN1, NF1, RET, SDHA, SDHAF2, SDHB, SDHC, SDHD, TMEM127, VHL*

What will the results tell me?

These tests can tell you if you have a variant that causes a higher risk for 1 or more types of cancer. It is important to remember that not everyone with a variant will develop cancer.

If testing finds a variant, what does this mean for my family members?

We share some of our genes in common with our relatives. If someone in the family has a gene variant, there is a chance other family members will have the same variant and can have an increased risk for cancer. You can inherit a variant from either your father or your mother. If you have a variant, your brothers, sisters, and children each have a 50% chance of having the same variant. Other relatives are also at risk. This is why it is important to share your test results with your family.

Relative	Their chances of having the same variant
Identical twin	100%
Parent, sibling, child, fraternal twin	50%
Grandparent, uncle, aunt, niece, nephew	25%
First cousin	12.5%

The genetic testing process

The first step is to talk with your genetic counselor or doctor about your personal and/or family history of cancer. This will help you figure out if testing is right for you. If you and your provider decide to move forward with testing, your doctor can order the test.

The next step is to have your sample collected either at your doctor's office or at a Quest Diagnostics Patient Service Center. When the test is finished, you and your doctor will get your results and can talk about them.

At what age should I consider getting tested?

Adults can be tested at any age. Most of the time genetic testing is not recommended for people under the age of 18. But there are some exceptions. For example, if there is a variant in your family that can cause childhood cancer, it may be a good idea for your children to be tested.

How long will it take for my results to come back?

On average, your doctor will receive the results 14 to 21 days from receipt of the sample and complete documentation.

Does insurance cover the cost of genetic testing?

It depends on your insurance company. Your insurance may cover some or all of the cost. To find out if your test will be covered, ask your doctor's office for help; they can contact your insurance company directly, or they can give you the details you need to contact your insurance company.

For more information, visit
Insurance.QuestDiagnostics.com

Could I lose my health insurance based on my test results?

Most likely not. There is a federal law called the Genetic Information Nondiscrimination Act (GINA). It protects most patients who have genetic testing. Because of this law, health insurance companies cannot use a genetic test result or family health history to:

- Cancel your health insurance
- Increase your insurance premium
- Refuse coverage

There are some exceptions. GINA does not offer protections for life insurance or long-term disability insurance. You can visit **http://ginahelp.org** for more information.

Making sense of your test results

Your doctor or genetic counselor will review your test results with you. There are 3 possible results:

- Negative

The test did not detect any variants in the cancer genes that were tested. A negative test can mean different things depending on the individual's personal and family history of cancer, and whether there is a known variant in the family. Although this greatly reduces your chance for a hereditary cancer syndrome, there are other genes that can cause an increased risk for cancer that may not have been tested. Your doctor can help you understand what your revised risk is, or if additional testing may be needed.

+ Positive

The test did detect a variant. This means that you have a higher risk for some types of cancer. Discuss cancer screening and risk reduction options with your doctor.

VUS Variant of unknown clinical significance

Sometimes changes in the genes are found but we don't know how these changes might affect your health. We call these "**variants** of unknown clinical significance (VUS)." Over time, we may learn more. Check with your doctor each year for updates about VUS.

Would a negative result mean I won't get cancer?

It depends. A negative test can mean different things depending on personal and family history. If there is a known variant in your family and your test results are negative, then you do not have a higher risk for cancer than other people. You have some risk, but it's the same as for everyone else.

However, if the cause for the cancer in your family is not known and your test results are negative, then your risk for cancer may still be increased. There could be a variant in a different gene that caused the cancer in your family.

Scientists are always learning more about the causes of **hereditary cancer**, and new genes are discovered each year. Be sure to let your doctor know about any changes in your personal or family history. You may wish to have additional genetic testing in the future.

Would a positive result mean I will develop cancer?

Not necessarily. A positive result means you have a variant that puts you at higher risk for some types of cancer. There are often options to help you lower your risk or prevent cancer altogether. You and your doctor will create a plan that you're comfortable with to lower your risk.

Lowering your risk for cancer if you have a positive result

If your results are positive for a hereditary cancer variant, then you likely have a higher risk for cancer.

What you can do to lower your risk for cancer

If you have a gene variant, there are options to lower your risk of cancer, such as:

- Increased cancer screening
- Begin cancer screenings at a younger age
- Surgery
- Medication
- Lifestyle changes

You should consult with your doctor to determine what options are best for you.

Important terms to know

DNA—the molecules that contain the biological instructions for making all the components of the cells in your body

Gene—a set of instructions made of **DNA** that tell your body how to develop and function

Genetic—having to do with a person's genes

Hereditary cancer—cancer caused by a genetic change or variant passed down from 1 generation to the next

Inherited—passed down from 1 generation to the next

Variant—a permanent change in DNA; sometimes called a 'mutation' or 'pathogenic/likely pathogenic' if the change is thought to have a harmful effect

Feel good about genetic testing.
The more you know, the more you can do to enjoy better health.

Quest Advanced® Oncology

Quest Diagnostics: **empowering better health** with diagnostic insights

Quest Diagnostics empowers people to take action to improve health outcomes. As one of the world's largest providers of clinical laboratory testing services, our diagnostic insights reveal new avenues to identify and treat disease, inspire healthy behaviors, and improve healthcare management. Quest annually serves 1 in 3 adult Americans and half the physicians and hospitals in the United States. We're here every day to support the health and well-being of you and your family.

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QuestDiagnostics.com