

# BrainTumorNext

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GENETIC TESTING FOR HEREDITARY BRAIN TUMORS

Because knowing  
your risk can mean  
early detection  
and prevention

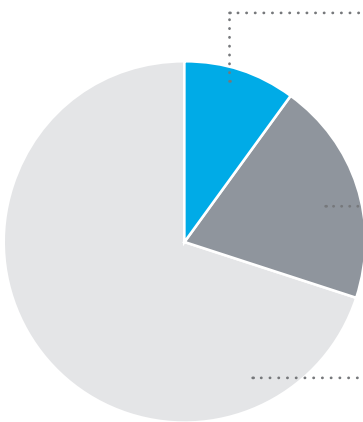


# Know the Basics



Brain tumors are the **most common** tumor/cancer in children and young adults (0-19 years old), so it may not be unusual to see a young age of diagnosis

## TYPES OF CANCER



### HEREDITARY CANCER

A clustering of cancer in a family due to inherited gene changes (mutations), which can be passed from parent to child

### FAMILIAL CANCER

A clustering of cancer in a family that may be due to genes and/or other shared factors, such as environment and lifestyle

### SPORADIC CANCER

Happens by chance in one or two related family members, typically at older ages

Brain tumors are the  
**16<sup>th</sup> most common**  
tumors/cancers in adults



**Fewer than 1%**

of people in the U.S. will be  
diagnosed with a brain tumor/  
cancer in his or her lifetime

## ABOUT HEREDITARY CANCER

Many people have a family history of cancer, but only **5-10% of cancer is hereditary.**

People who have these gene mutations **are born with them** - they do not develop over time.

Learning if you have an **inherited mutation** can help you know more about your cancer risks.

People with a higher chance of developing cancer may need screening, like prostate exams, that start at **younger ages, and occur more often.**

# Should You Have Genetic Testing?

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## **IF YOU ANSWER “YES” TO ANY OF THE QUESTIONS BELOW,**

hereditary brain tumor genetic testing may be something for you and/or your family members to consider.

**1**

Have you/your family members\* been diagnosed with a brain tumor/cancer at a young age?

**2**

Have you/your family members\* been diagnosed with more than one brain tumor/cancer?

**3**

Have you/your family members\* been diagnosed with more than one cancer, such as a brain tumor and colorectal cancer?

**4**

Have multiple people on the same side of your family had brain and/or other tumors/cancers?

**5**

Have any of your family members\* been found to have a cancer gene mutation?

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*Your healthcare provider may identify other reasons why you could consider genetic testing.*

*\*“Family members” refers to blood relatives, such as brothers/sisters/parents/grandparents/aunts/uncles/cousins*

# Genes and Associated Cancers

BrainTumorNext includes 27 genes that are linked to an increased lifetime risk for brain and/or other tumors/cancers. The check marks below indicate the associated cancer types for each gene.

GENE(S)	BRAIN/OTHER NERVOUS SYSTEM	BREAST	OVARIAN	COLORECTAL	UTERINE	PANCREATIC	PROSTATE	STOMACH	KIDNEY	ENDOCRINE*	OTHER
AIP	✓										
ALK	✓										✓
APC	✓			✓		✓		✓		✓	✓
CDKN1B	✓									✓	✓
CDKN2A	✓					✓					✓
DICER1	✓		✓								
MEN1	✓									✓	✓
MLH1, MSH2, MSH6, PMS2	✓		✓	✓	✓	✓	✓	✓	✓		✓
NBN	✓	✓					✓				✓
NF1	✓	✓								✓	✓
NF2	✓									✓	✓
PHOX2B	✓										✓
POT1	✓										
PRKAR1A	✓									✓	✓
PTCH1	✓										✓
PTEN	✓	✓		✓	✓				✓	✓	✓
SMARCA4	✓		✓								✓
SMARCB1	✓								✓		✓
SMARCE1	✓										
SUFU	✓										✓
TP53	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TSC1, TSC2	✓								✓		✓
VHL	✓								✓	✓	✓

\* Endocrine indicates at least one of the following: paraganglioma, pheochromocytoma, thyroid cancer, carcinoid tumors, pancreatic neuroendocrine tumors, and/or adrenal tumors

# What are the Benefits of Genetic Testing?

## FOR YOU:

Your healthcare provider can adjust your cancer screening plan (such as age of initial screening, type, and frequency) based on your genetic test results.

- Examples of cancer screening may include imaging, such as MRIs

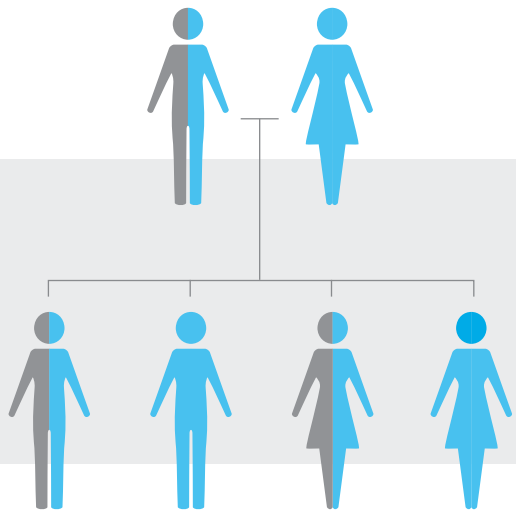
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Your doctor may discuss the possibility of other personalized treatment options based on your genetic test results.

## FOR YOUR FAMILY MEMBERS:

If you test positive for a genetic mutation, your close family members (like your parents, brothers, sisters, children) have a 50/50 random chance of also having the same mutation.

- Has genetic mutation
- No mutation



- Men and women have the same chance to inherit a mutation, but their chance to develop cancer may be different.
- Typically genetic testing is recommended for adults, but it is important to discuss genetic testing for children under age 18 with your healthcare provider to determine if it may be helpful.

# Possible Genetic Test Results

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## POSITIVE

**A mutation was found in at least one of the genes tested**

There are increased risks for cancer and may be management recommendations specific to the gene that has a mutation

Genetic testing for certain family members may be recommended

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## NEGATIVE

**No genetic changes were found in any of the genes tested**

Cancer risk(s) and management recommendations are based on personal and family history

Talk to your healthcare provider to find out if genetic testing should be considered for your family members

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## VARIANT OF UNKNOWN SIGNIFICANCE (VUS)

**At least one genetic change was found, but it is unclear if this change causes an increased risk for cancer or not**

Cancer risk(s) and management recommendations are based on personal and family history

Talk to your healthcare provider to find out if genetic testing should be considered for your family members

*It is possible to have a combination of positive and VUS results, since multiple genes are tested.*



# Resources For You

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Ambry's Patient Education Website

[ambrygen.com/patient](https://ambrygen.com/patient)

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American Cancer Society

[cancer.org](https://cancer.org)

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American Society of Clinical Oncology

[cancer.net](https://cancer.net)

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Genetic Information Nondiscrimination Act

[ginahelp.org](https://ginahelp.org)

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National Cancer Institute

[cancer.gov](https://cancer.gov)

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American Brain Tumor Association

[abta.org](https://abta.org)

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National Brain Tumor Society

[braintumor.org](https://braintumor.org)

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I'm Too Young For This!

[stupidcancer.org](https://stupidcancer.org)

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## FIND A GENETIC COUNSELOR

National Society of Genetic Counselors

[nsgc.org](https://nsgc.org)

Canadian Association of Genetic Counsellors

[cagc-accg.ca](https://cagc-accg.ca)

# Frequently Asked Questions

## 1 HOW IS GENETIC TESTING PERFORMED AND HOW LONG DOES IT TAKE?

Genetic testing is done using a blood or saliva sample, which is collected using a special kit that is shipped overnight to Ambry (all coordinated by your healthcare provider). Testing looks for mutations that cause an increased risk for cancer. It takes less than three weeks for the testing to be completed and results are sent to your healthcare provider.

## 2 WHAT WILL HAPPEN WHEN MY RESULTS ARE READY?

Your healthcare provider will receive your results; they will not be sent directly to you. Every healthcare provider may have a different method and time frame to contact you to discuss your results, so it is important to discuss this process with them. Based on your test results, your healthcare provider will discuss any next steps.

## 3 WILL MY GENETIC TEST RESULTS AFFECT MY INSURANCE COVERAGE?

In the U.S., the Genetic Information Nondiscrimination Act (2008) prohibits discrimination by health insurance companies and employers, based on genetic information. Depending on where you live in the world, you may have different (or fewer) laws in this area. Visit [ginahelp.org](http://ginahelp.org) to learn more.

## 4 SHOULD I TELL MY FAMILY MEMBERS ABOUT MY GENETIC TEST RESULTS?

It is important to share your results with your family members as they may provide additional information about their cancer risks and management options. Your healthcare provider may be able to guide you on finding the best way to inform family members.

## 5 WILL GENETIC TESTING BE COVERED BY MY INSURANCE?

Many insurance plans cover genetic testing and Ambry is contracted with the majority of U.S. health plans. Your out-of-pocket cost may vary based on your individual plan; therefore, we offer personalized verification of insurance coverage and financial options for your genetic testing. A team of dedicated specialists is available to help you get access to the genetic testing you need and answer any questions you have about our payment options. Call or email our Billing department at +1.949.900.5795 or [billing@ambrygen.com](mailto:billing@ambrygen.com) with any questions.

## 6 WHAT IS AN EXPLANATION OF BENEFITS (EOB)?

Your insurance company sends you an EOB to explain any services paid on your behalf. You can contact us directly to speak with a Billing specialist with any questions or concerns about your EOB. Some genetic tests take weeks to process in order to receive the best results. In addition, insurance companies can take several weeks or even a couple of months to process claims.

## STILL HAVE QUESTIONS?

Talk to your doctor or visit our website: [ambrygen.com](https://ambrygen.com)

# Finding Answers.