

Precise™

Oncology Solutions



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Bringing clarity to cancer treatment

 **Myriad**
genetics

Health. Illuminated.

Why genetic testing?

At its most basic, cancer is caused by changes, or alterations, to a cell's DNA. These alterations change the way the cell behaves, including when it grows, divides, or dies. Cells that are unable to be repaired by the body can lead to cancer and cancerous tumors.



The origin of cancer can be:

Hereditary

A hereditary cancer is caused by a gene alteration that is passed down in the family from parent to child. People with hereditary cancer are more likely to have relatives with the same type or related cancer(s). They may develop more than one type of cancer and/or the cancer may occur at an earlier than average age.

Familial

Familial cancers are likely caused by a combination of genetic (hereditary) and environmental factors. People with familial cancer may have one or more relatives with the same type of cancer; however, there does not appear to be a specific pattern of inheritance (i.e., the cancer risk is not clearly passed from parent to child).

Sporadic

Sporadic cancers occur by chance. People with sporadic cancer typically do not have relatives with the same type of cancer, and the cancer tends to occur at later ages.

Genetic testing is a vital component of cancer treatment for two reasons:



Certain alterations allow for more targeted treatment options



Understanding any familial/future hereditary risk for you and your family.



Types of genetic testing

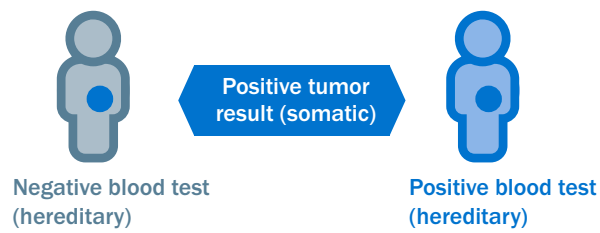
There are two main types of genetic testing for cancer: **germline** (hereditary) and **somatic** (tumor).

Germline testing is conducted by either a blood or saliva sample and is looking for alterations that occur in the body at birth. **It does not determine if you have cancer.** Instead, it is looking for alterations in biomarkers (a DNA sequence that causes or is associated with disease) that are associated with cancer. Results can inform treatment options if you currently have cancer, can indicate your risk for a secondary cancer, and can indicate potential increased cancer risk for your family.

Somatic testing is performed on a biopsy or sample of a cancerous tumor. It can determine if biomarkers are present in the tumor which could help guide treatment decisions. **Some alterations can exist only in the tumor and won't be found within the rest of the body.**

The need for both

Since some alterations exist outside of a tumor and others only within a tumor, it is important that **both** somatic and germline testing are performed. Often certain patients that are eligible for advanced treatment options are missed if only somatic testing is completed. For instance, **1 in 10** pancreatic, **1 in 8** breast, **1 in 6** prostate, and **1 in 4** ovarian cancer patients have germline alterations that may benefit from a targeted therapy.¹⁻⁴



■ Normal functioning cells ■ Mutated cells

Treatment options

The type of cancer and your biomarker status can help guide your treatment options. Some common biomarkers are BRCA, TMB and MSI, and HRD status.

BRCA – Everyone is born with BRCA genes. Normally the proteins produced by the *BRCA1* and *BRCA2* genes prevent cells from developing into cancer. Alterations in these genes, either somatic or germline, can guide treatment options such as targeted chemotherapies, PARP inhibitors, and surgical treatments.

HRD (for patients with ovarian cancer) – It is normal for breaks to occur in our DNA and these are typically quickly repaired without problems. However, when these breaks are not repaired problems can occur. One of the ways that our bodies repair DNA is through homologous recombination (HR). This pathway can become broken and no longer repair the DNA, this is referred to as homologous recombination deficiency or HRD.

Approximately 50% of women with ovarian cancer have homologous recombination deficiency, known as HRD positive (HRD+); and may be eligible for treatment with PARP inhibitor therapy.

PARP inhibitor therapy – PARP inhibitors, or poly (ADP-ribose) polymerase inhibitors are a type of oral medication that are prescribed by a physician. They are used to treat certain cancer types with specific genetic alterations. Not all cancer patients are eligible for PARP inhibitor therapy.

PARP inhibitors work by blocking DNA from being repaired. If the DNA damage cannot be repaired, the cancer cell will be killed.

TMB and MSI – Tumor mutational burden (TMB) and microsatellite instability (MSI) are two tests that measure the amount of DNA alterations that exist in the cancer cells. The higher the number for either of these biomarkers, it is more likely that the cancers will respond to certain drug therapies.

Other treatment

Other treatment options can include specific surgical techniques or other medication. Based on your germline and somatic results, your physician will work with you to determine the best approach to your cancer treatment.

Risk to family members

Germline alterations affect your family's risk of developing certain cancers. These are the hereditary alterations that are passed between parent and child. Parents, siblings, and children have a 50% chance of having the same alterations.

Knowing whether they carry a gene alteration can allow family members to make more informed decisions on strategies to reduce their cancer risk. For those who test negative, the results can bring peace of mind.

Talk to your doctor about genetic testing

You and your doctor will work together to find the right treatment plan based on your diagnosis and the results of your genetic testing. Remember, you can have a genetic alteration that you were born with (inherited) that could be missed if only tumor-based testing is ordered by your physician. To gain the most insight into your treatment options, both germline and somatic testing should be performed.

For any additional questions or information, please contact Myriad Medical Services at 1-800-469-7423 x 3850.



Myriad Promise™

Because patients and their families use test results to make life saving medical decisions, Myriad Genetics promises to provide affordable access to testing, a lifetime commitment to accurate results, and comprehensive support for all appropriate patients and their families.

For more information:

www.myriad.com/oncology/precise

References

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