Article Series Genetic Testing All

Understanding the role of genetic and biomarker testing in cancer care

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Cancer is complex, but understanding what causes it can help doctors identify who may be at risk and what care plan may work best for people who have already been diagnosed.

Let’s start with the basics. Your body is made up of trillions of cells, and within each cell is DNA. DNA is what makes up genes, which are the instructions your cells use to make all the building blocks that your body needs to work normally.

When cells make new cells, they first copy their DNA. Sometimes a mistake may occur during copying — this is called a mutation. There are two main types of mutations: inherited and acquired. An inherited mutation is passed down from a parent, while an acquired mutation occurs some time later in life.

Cancer is mainly caused by mutations. Typically, many mutations are needed for a cell to become a cancer cell. These mutations may affect different genes that control how your cells grow and make new cells. When cancer cells start to grow uncontrollably, they may form a tumor. We don't yet know all the genes and mutations that causes normal cells to become cancer cells, but there are some we can currently test for.

The information gathered from a person's genes allows doctors to use what's known as precision medicine (or personalized medicine) to treat them. With precision medicine, doctors choose treatments based on how a person's specific mutations may affect their cancer — or their risk for getting cancer. Two techniques used in precision medicine are genetic testing and biomarker testing.

Genetic testing is a type of testing that looks for certain inherited mutations. For people who are at high risk of developing certain cancers, this testing can give important information to doctors that they can then use to make recommendations on screenings and other tests or suggest lifestyle changes to help lower the risk of cancer.

Biomarker testing is a type of testing that looks for certain acquired mutations in cancer cells. This type of testing is used for people who are already diagnosed with cancer. With the information from biomarker testing, doctors can better understand information about a person's cancer and select an appropriate cancer treatment.

For more information on precision medicine, the National Cancer Institute and the American Cancer Society have great resources. Additionally, you can learn here about common cancer terms that your care team may mention when talking about precision medicine.