Research over the past few decades has shown that genes play a key role in the development and behavior of cancers. In short, genes are the instructions that tell our cells how to grow and function to keep us healthy. Therefore, changes within those instructions can cause cells to lose their regulation and grow out of control, leading to a tumor.

The majority of cancers are *sporadic*, or occur just by chance. Within cancer cells, genetic mutations are found that are different from the healthy, non-cancerous cells in the body. As noted above, these genetic mutations are understood to cause and influence the abnormal growth of the cancer cells. Typically, sporadic cancers occur in people when they are older, and there is not a strong pattern of cancer within the family (although because cancer is common, it is not unusual to have some history of cancer in the family). The causes for sporadic cancers are largely unknown, but may include environmental and lifestyle risk factors (e.g. smoking, UV exposure) as well as the natural and unavoidable process of aging.

In about 5-15% of cancers, the underlying cause is due to an *inherited* gene mutation that increases the risk to develop certain types of cancer during the lifetime. An inherited mutation (passed from parent to child) is present from conception and is found in every cell of the body. Although by itself the mutation is not cancerous, it increases the chance for other random mutations to occur and accumulate in the cells, leading to the development of cancer.

Here are some things that may indicate that someone has a higher risk for hereditary cancer:

- early-onset cancers (i.e. diagnosed before the age of 50 years),
- individuals with multiple primary cancers (i.e. 2 or more cancers of separate origin, not the spread of one cancer to other areas of the body)
- rare types of cancer (i.e. ovarian)
- family history of the same type or related types of cancers in multiple individuals and generations
- persons from certain ancestral backgrounds (e.g. Ashkenazi Jewish ancestry) have a higher chance to carry mutations common to those populations
- a known pathogenic variant in a cancer risk gene has been previously identified in a relative

A third category for classifying cancer risk is *familial* cancer. These descriptions may be used when there appears to be more cancer in a family than we would expect by chance alone, but the cause is not identified. There may be a combination of multiple genetic and/or environmental risk factors that are increasing the risk for cancer in the family, or there

could be a genetic cause for the cancer that has not yet been identified. Therefore, until more clear answers can be found, the most important message is that the family should be considered at some level of increased cancer risk, and be managed based on their unique history.

Click here to learn more about scheduling a genetic counseling appointment for questions about hereditary cancer predisposition.

Additional Resources

*Positive Results Facebook Group
Genetic Support Foundation hosts a Facebook group for Hereditary Cancer Support and Resources. Get trusted information and join a community of support.
*Cascade Screening Connector
Genetic Support Foundation has partnered with the Washington State Department of Health to provide cascade screening to help people identify and contact family members who may have an increased chance of developing cancer.
*FORCE (Facing Our Risk of Cancer Empowered)
The FORCE mission is to improve the lives of individuals and families facing hereditary cancer. Resources include peer navigation and expert-reviewed information.
*AliveAndKicknAliveAndKickn is a nonprofit working to improve the lives of individuals and families affected by Lynch Syndrome and associated cancers through research, education, and screening.
*Health Experiences USAThis national research project brings patient voices into the healthcare experience and features video clips of people facing hereditary cancer. Individuals from a variety of backgrounds share both positive and negative experiences about living with hereditary cancer.

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