



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.

## Related Articles

- [Genetic Testing for Hereditary Cancer](#)  
Genetic testing for hereditary cancer first starts with a genetic consultation to collect and analyze the personal and/or family history of cancer. If a pattern suggestive of hereditary cancer is identified, then genetic testing may be considered for further clarification or confirmation of the specific cancer risks. Depending on...
- [Why Consider Genetic Testing for Cancer Risk?](#)  
There are several reasons why someone may consider genetic testing for hereditary cancer predisposition, which are outlined below. High-Risk Screening and Risk Management One of the primary benefits of knowing about hereditary cancer risk is the ability to take control of that risk in partnership with your healthcare team. Genetic...
- [Common Concerns about Genetic Testing](#)  
Genetic testing for cancer risk is a very personal decision, and is not right for everyone. Some people are concerned about the benefits versus potential risks, while others are more concerned with insurance or privacy issues. Click below to learn more about these common concerns pertaining to genetic testing: Will...
- [DNA Banking](#)  
If genetic testing is performed but does not identify a harmful genetic variant, or if testing is declined for any reason, DNA banking is another resource available to ensure the ability for future genetic testing of one's DNA. This is primarily for the benefit of family members, and can allow...
- [Breast Cancer](#)  
Breast cancer is a complicated disease, and there is no single explanation for it. In the vast majority of breast cancer, the cause is likely some genetics, some environmental factors (such as exposures to toxins and/or chemicals), and a lot of it is just bad luck. In most cases...