Genetic Testing for Familial Colorectal Cancer

What is Familial Colorectal Cancer?

Colorectal cancer is cancer that starts in the colon or rectum. Depending on where your cancer starts, you may hear it called “colon” cancer or “rectal” cancer. Family history is an important part of colorectal cancer risk. About 5-10% of colorectal cancer cases are hereditary (familial). Hereditary cancer happens when changes or mutations in genes are passed down from your parents. These genetic mutations cause family cancer syndromes, which can lead to cancer. However, just because there is a family history of cancer does not mean there is a cancer syndrome or that you will get cancer. Testing for genetic mutations is one way to get an idea of your risk of developing cancer.

What are the genetic mutations linked to colorectal cancer?

Mutations of genes are like spelling errors in the genetic code of a gene. Those with a gene mutation may be at higher than average risk for developing certain cancers. A genetic mutation that increases the risk of colorectal cancer is present in some families.

The three syndromes that most often cause familial colorectal cancer are:

- **Hereditary non-polyposis colorectal cancer (HNPCC)**: Also referred to as Lynch Syndrome. About 2-4% of colorectal cancers are caused by this syndrome. The genes most often affected in HNPCC are MLH1, MSH2, MSH6, and PMS2. People with this syndrome are at a higher risk than the average person for developing colon cancer. They are also at a higher risk for stomach, ovarian and several other cancers.
- **Familial adenomatous polyposis (FAP)**: The gene affected in FAP is the APC gene. It causes a person to develop many growths (called polyps) in the colon and rectum. This can occur in both males and females. These growths can begin in teenagers and young adults. So many polyps develop that there is a high risk that one or several of them may become cancerous. About 1% of all colorectal cancers are caused by this syndrome. If not treated, most people with FAP will develop colon or rectal cancer by the time they are 40 years of age. People with FAP are also at risk for developing tumors in other parts of the body, including the thyroid, pancreas, or liver. Two subsets of this syndrome are attenuated FAP (AFAP) and Gardner syndrome.
- **APCI 1307K**: This mutation occurs on the same gene which causes FAP. Like FAP, it causes many polyps in the colon and rectum, which can lead to colon or rectal cancer at a young age. However, this mutation is found only in individuals of Ashkenazi Jewish descent.

Other syndromes that can lead to colorectal cancer include:

- **Peutz-Jeghers syndrome (PJS)**: This syndrome can cause a certain kind of polyp or growth in the bowels called a “hamartoma.” This syndrome causes a much higher risk for colorectal cancer, as well as cancer of the pancreas, breast, and ovaries, among others. The gene affected in PJS is the STK11 (LKB1) gene.
- **MUTYH-associated polyposis (MAP)**: This syndrome also causes many polyps to form in the colon. This syndrome causes a much higher risk of colorectal cancer, as well as other cancers of the GI tract

and thyroid. The gene affected in MAP is the MUTYH gene.

Who should have genetic testing?

If your family has a strong history of colorectal cancer or polyps, you are at a higher risk of colorectal cancer yourself. Your risk for familial colorectal cancer is higher if you have:

- A first-degree family member (parent, brother, or sister) who has cancer.
- 2 or more family members (first-degree or distant) who have cancer.
- 2 or more family members (first-degree or distant) who have colorectal cancer.
- Family members who were diagnosed with cancer at a younger age.

In a family with a history of colorectal cancer, the first step may for a family member who has had colorectal cancer to have genetic testing. If that person is found to have a genetic mutation, then other family members can be tested to see if they also have the same mutation.

If you are worried you or your family may have a genetic mutation or syndrome, you may want to talk with a genetic counselor. A genetic counselor will discuss what having genetic testing can mean for you and your family. The genetic counselor will go over the risks and benefits of testing and how results will affect cancer screening and prevention recommendations for you.

Resources for More Information

OncoLink: Genetic Counseling and Genetic Testing

American Cancer Society: Genetic Testing, Screening, and Prevention for People with a Strong Family History of Colorectal Cancer.