Cancer Genetics Summary

Familial Adenomatous Polyposis (FAP)

Familial Adenomatous Polyposis (FAP) is a genetic mutation that is linked to colorectal cancer. FAP represents less than 1 percent of all colorectal cancers and affects approximately 1 in 8,000 people. The primary feature of FAP-related colorectal cancer is polyposis, which is the appearance of hundreds to thousands of colon polyps, usually by age 10 and almost always by age 35. If polyposis is present, colon cancer *will* occur. The average age of onset is 39.

FAP results from a mutation in the adenomatous polyposis coli or APC gene. About 70 percent of FAP mutations are inherited; the remainder result from new mutations. In addition to colon and rectal cancer, this gene mutation carries an increased risk for cancers occurring outside the colon (extracolonic), including thyroid, brain, bone, upper gastrointestinal tract and desmoid tumors. Approximately 75 percent of FAP-affected individuals also have congenital hypertrophy of the retinal pigment epithelium (CHRPE) or pigmented lesions of the retina that can be detected by funduscopic examination of the eyes. This benign marker is one indication used to diagnose FAP.

FAP Cancer Risks
Most people carrying the APC gene mutation will develop multiple polyps by age 20. The risk for colon cancer is close to 100 percent by age 40, unless the colon is surgically removed. Patients who have had the colon removed have a 10 percent risk of developing cancer in rectal tissue, the gallbladder and/or bile ducts.

Approximately 40 percent of people with FAP develop polyps in the upper gastrointestinal tract. Although most are benign, screening with biopsy is recommended to monitor for extracolonic tumors. People with FAP have an 11 percent risk of duodenal cancers and an increased risk for tumors in the upper gastrointestinal tract.

Some families with FAP have an increased risk of developing desmoid tumors (a rare type that develops in the fibrous tissue that covers muscles and other organs) Desmoids are locally invasive, nonmetastasizing soft tissue tumors that can develop anywhere in the body, but feature prominently in the small bowel mesentery, peritoneum or abdominal wall. There is a 25 percent risk of desmoid tumor development if a first degree relative with FAP exhibits the tumor and an 8 percent risk if a third degree relative has desmoid tumors.

People with FAP also have a slightly increased risk of papillary cancer of the thyroid and of brain tumors.

APC Gene
The tumor suppressor gene known to cause FAP when altered by a cancer-predisposing gene mutation is called the Adenomatous Polyposis Coli or APC gene, located on the long arm of chromosome 5. When working properly, this gene is responsible for inhibiting uncontrolled cell growth. Every person has two copies of each gene. If a mutation occurs in one of their APC genes, they have a backup copy to protect them. People with FAP start life with one copy already mutated; if the other copy becomes mutated, it may no longer be able to regulate cell growth and this can lead to tumor formation.

Genetic Testing for FAP
Gene testing is available to identify a mutation in the APC gene. Identifying a mutation confirms a diagnosis of Familial Adenomatous Polyposis and the risks associated with FAP. Predisposition gene testing is best performed on someone who has had cancer. If that individual is found to have a change in the suspect gene, then other relatives can be reliably tested.

If a mutation in the APC gene is found in your family but your test results show you did not inherit the gene mutation, your chance of developing cancer would be the same as for the general population. If you do not have the gene mutation, your children will not inherit the mutation from you.

For more information or questions, call 503-413-6534.

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