About *APC* Gene Mutations

About Genes

Genes are in every cell in our bodies. Genes are made of DNA, which gives instructions to cells about how to grow and work together. We have two copies of each gene in each cell—one from our mother and one from our father. When genes work properly, they help keep cancer cells from developing. If one copy of a gene has a mutation, the gene cannot work correctly. This raises the risk for certain cancers of precancerous lesions, like polyps.

The main job of the *APC* gene is to help prevent cancer from forming. If you have a mutation in one copy of the *APC* gene, it cannot perform its job as it normally would. A person who inherits a mutation in *APC* has a hereditary cancer syndrome called *Familial Adenomatous Polyposis (FAP) or Attenuated Familial Adenomatous Polyposis (AFAP)*.

Familial Adenomatous Polyposis (FAP)

FAP is passed down through families and increases the risk of getting specific types of polyps (small growths) in the colon. These are called adenomatous polyps. If untreated, these polyps may turn into colon cancer.

Classic FAP

People with FAP are at risk for polyposis meaning they can have hundreds to thousands of polyps develop in the colon. These polyps can begin to grow as early as age 10. Without screening and/or risk-reducing surgery, the average age people with FAP get colon cancer is 35 years old. The risk of colon cancer by the age of 50 is over 90% (9 in 10 people).

Attenuated FAP (AFAP)

People with AFAP are also at risk for polyposis, however they do not develop as many polyps (<100) as people with Classic FAP. Typically, these polyps begin to appear a bit later, in the late teenage years. The average age of colon cancer diagnosis for people with AFAP is at 50-55 years old. For AFAP, the risk of colon cancer by the age of 80 years old is 70% (7 in 10 people).

Other Cancers outside the Colon

Other cancers seen more often in people with *APC* mutations include small bowel, thyroid, pancreatic, brain, liver, bile duct, and stomach.

Non-Cancerous Features of FAP

These things are seen more often in people with FAP, but not all individuals with these features will have FAP.

- Desmoid (soft tissue) tumors
- Dark marks on the retina of the eye (CHRPE)
- Unusual teeth, bone, and skin findings

Recommendations

The polyps that develop in people with FAP can begin forming in late childhood. For people with FAP, we recommend beginning screening the colon (colonoscopy or sigmoidoscopy) starting at ages 10-15. Follow up should happen at least every 1-2 years but may be more frequent if many polyps are found.

For people with AFAP, we recommend this colon screening begin between ages 18-20 and continue every 1-2 years.

Colonoscopies are recommended until there are too many polyps in the colon or a colon cancer is diagnosed. At that point, we recommend colectomy (removal of the colon). Sigmoidoscopies are still needed after colectomy to evaluate at-risk areas that remain.

Other screening:

- Screening the stomach and small intestine for polyps (esophagogastroduodenoscopy, EGD) at age 20-25
- Thyroid imaging at every 2-5 years starting in late teenage years
- Regular physical exams
- Consider baseline imaging for desmoid tumors
- Liver cancer screening with imaging and serum alpha-fetoprotein concentration every 3-6 months in children ages 0-5

Children and Siblings

Children of an individual with an *APC* mutation have a 1 in 2 or 50% chance of also carrying an *APC* mutation. Genetic testing is recommended children by age 10-15 depending on whether the family has FAP or AFAP. If parents are interested in liver cancer screening, testing can be done earlier.

If an affected individual has a parent with an *APC* mutation, all siblings would be at a 1 in 2 or 50% risk. However, 20-25% of people with FAP have a new gene mutation that was not inherited from a parent, therefore siblings would not be at the 50% risk. A genetic counselor can help you to know who in your family may be at risk and can help give you ideas on how to tell other family members about FAP.

Family Members Who Test Negative

Family members who do not have a mutation in *APC* are expected to be at the average population risk for colon cancer.

It is important to know which side of the family carries the *APC* mutation. This allows those relatives to know about their cancer risk. A genetic counselor can help you know who in your family should be tested.

Do you have questions about your risk for cancer?

Our doctors and genetic counselors can help find the cancer screening plan you need. Call Huntsman Cancer Institute's Family Cancer Assessment Clinic to learn more: 801-587-9555. huntsmancancer.org/fcac