SCREENING AND MANAGEMENT OF HEREDITARY COLON CANCER

Genetic testing is important for people who may have inherited colon cancer syndromes because life-saving intervention is available through early detection and prevention of cancer.

Familial Adenomatous Polyposis (FAP)

- Beginning at age 10–12 years: yearly flexible sigmoidoscopy.
- Once colon polyps are found, or by age 20–25 yrs:
  - If there are only a few polyps — yearly colonoscopy to remove precancerous polyps.
  - If there are many polyps — surgery to remove the entire colon.
  - Upper endoscopy every 1–3 years.

Lynch syndrome/HNPCC

- Beginning at age 20–25 years:
  - Colonoscopy every 1–2 years to remove precancerous polyps.
  - Removal of some or entire colon if cancer is found.
- Beginning at age 30–35 years:
  - Upper endoscopy every 2–3 years.
  - For women: annual endometrial biopsy and vaginal ultrasound.
- Preventive removal of uterus, ovaries, and fallopian tubes may be considered for women who have completed childbearing.
- Annual urinalysis with cytology.

Additional screening is recommended for specific cancers based on personal and family history.

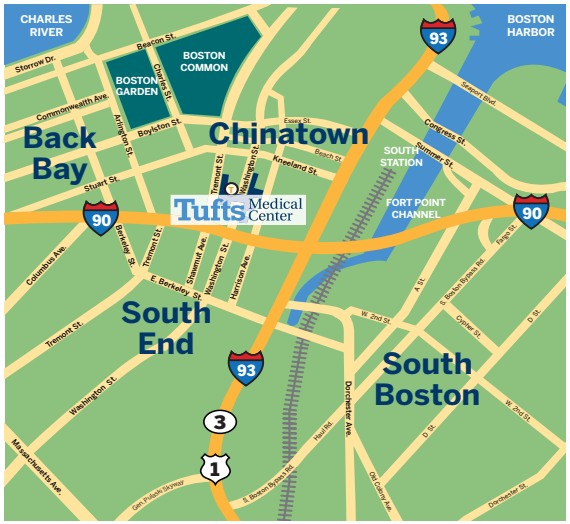
To make an appointment or ask a question, call the Division of Colon and Rectal Surgery at **617-636-6190** or the Division of Genetics at **617-636-8100.**

Gastroenterology: 617-636-5884

Medical Oncology: 617-636-6227

Radiation Oncology: 617-636-6161

www.tuftsmedicalcenter.org/ColonRectalSurgery



Tufts Medical Center is easily accessible by car from the Massachusetts Turnpike (Route 90), the Central Artery and the Southeast Expressway (Route 93). Tufts Medical Center is located in downtown Boston, in Chinatown and the Theater District and within walking distance of the Boston Common, Downtown Crossing and many hotels and restaurants. For directions, visit www.tuftsmedicalcenter.org/AboutUs/Directions.

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09-062 2011

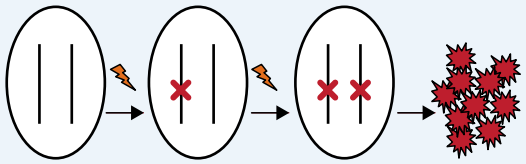
Hereditary Colon Cancer

What you should know about genes and cancer

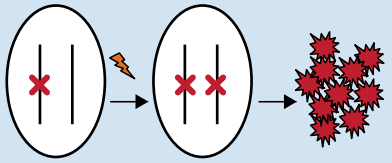
Tufts Medical Center

CANCER AND GENES

Most cancers are sporadic events, occurring randomly as we age. But 5–10% of all cancers are due to inherited gene changes called mutations. Genes are pieces of DNA code that regulate cell growth and replication. When a cell's genes become mutated, the cell can undergo uncontrolled growth resulting in cancer. Gene mutations can be inherited, or passed down to one's children, and people with inherited gene mutations have a higher risk of cancer in their lifetimes. This is why:



Most people are born with two normal copies of protective genes in every cell of the body. Over time, certain environmental or bodily processes may cause a mutation to one gene copy in one cell — this is the first "hit." One normal copy of the gene remains and the cell is still protected from cancer. As time goes on, a second "hit" may cause a mutation of the second gene copy. Now the cell is no longer protected because both gene copies are damaged, and a cancer may begin to develop.



People with an inherited gene change are born with one mutated gene copy in every cell of the body. So, it only takes one hit for a cell to accumulate two damaged gene copies and lose its protection against cancer. Cancer can grow after only one total hit. This is why people with inherited gene mutations experience cancer earlier and more frequently in their lifetimes.

HEREDITARY COLON CANCER

There are two major types of inherited colon cancer: Familial Adenomatous Polyposis (FAP) and Lynch syndrome, which is also called Non-polyposis Colorectal Cancer (HNPCC).

Familial Adenomatous Polyposis (FAP)

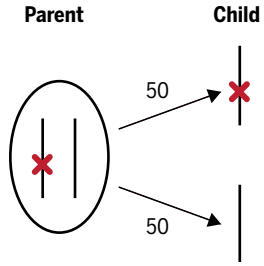
- FAP is caused by an inherited gene change in the Adenomatous Polyposis Coli (APC) gene. The healthy, unchanged APC gene product protects the colon from developing polyps and cancer.
- Individuals with FAP develop hundreds to thousands of polyps (abnormal mushroom-like growths) throughout the digestive tract starting at a young age — usually as a teen or young adult.
- These polyps, found in the colon and rectum, are called adenomas. Adenomas are precancerous. Because people with FAP have so many adenomas, they have an increased chance that one or more will develop into cancer.
- Thyroid, small intestine, stomach, and brain cancers may occur as part of FAP as well as childhood hepatoblastoma.

Lynch syndrome/HNPCC

- Lynch syndrome is caused by an inherited change in a mismatch repair gene that normally helps to prevent cancer. The genes that may be mutated in Lynch syndrome are MLH1, MSH2, MSH6, PSM2, and EPCAM.
- People with Lynch syndrome have up to a 60–80% lifetime risk of developing colon cancer, often before the age of 50.
- Women with Lynch syndrome have up to a 40–60% lifetime risk of developing endometrial cancer.
- Ovarian, stomach, urinary tract, liver and bile duct, small intestine, skin, and brain cancers may also occur as part of Lynch syndrome.

INHERITING FAP OR LYNCH SYNDROME

Both FAP and Lynch syndrome are passed on in an autosomal dominant fashion. This means that each time a person with FAP or Lynch syndrome has a child, there is a 50% chance (1 out of 2) that the child will inherit the mutated gene. Males and females have an equal chance of being affected. FAP and Lynch syndrome do not skip generations. The mutated genes increase the likelihood of getting cancer, but not everyone with the mutated gene will get cancer.



DIAGNOSING HEREDITARY COLON CANCER

Symptoms

Early polyps rarely cause symptoms. Symptoms of colon cancer include bright red blood in the stool; thin stools; prolonged diarrhea and constipation; abdominal pain, cramping, or bloating; urge to have a bowel movement when there is no need; and unexplained weight loss.

Genetic Testing

People who have a personal or family history of early onset colon cancer or other related cancers may benefit from genetic testing. A genetics professional can help determine whether you should have genetic testing. Genetic testing is performed by taking a small blood sample to be analyzed for the causative gene mutations, and is accompanied by genetic counseling. **Genetic testing is often covered by insurance when medically necessary.**

Ask your doctor if genetic counseling for hereditary colon cancer syndromes may be right for you.