Gastrointestinal Carcinoid Tumor Causes, Risk Factors, and Prevention

Risk Factors

A risk factor is anything that affects your chance of getting a disease such as cancer. Learn more about the risk factors for gastrointestinal carcinoid tumors.

- Gastrointestinal Carcinoid Tumor Risk Factors
- What Causes Gastrointestinal Carcinoid Tumors?

Prevention

At this time, there is no known way to prevent gastrointestinal carcinoid tumors. Since smoking might increase the risk of carcinoid tumors of the small intestine, not starting or quitting smoking may reduce the risk for this disease.

Gastrointestinal Carcinoid Tumor Risk

Factors

A risk factor is anything that increases your chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, like smoking, can be changed. Others, like a person's age or family history, can't be changed.

In some cases, there might be a factor that may decrease your risk of developing cancer. That is not considered a risk factor, but you may see them noted clearly on this page as well.

But having a risk factor, or even many, does not mean that you will get cancer. And some people who get cancer may not have any known risk factors. Here are some of the risk factors known to increase your risk for GI carcinoid tumors.

Genetic syndromes

Multiple endocrine neoplasia, type I

This is a rare condition caused by inherited defects in the *MEN1* gene. People with this syndrome have a very high risk of getting tumors of the pituitary, parathyroid, and pancreas. They also have an increased risk of carcinoid tumors. Some studies estimate that inherited mutations of the *MEN1* gene are responsible for about 5% to 10% of carcinoid tumors. Most of these are gastric (stomach) carcinoids. Children have a 50/50 chance of inheriting this syndrome from a parent.

If you have family members with the MEN1 syndrome, you might want to talk to your doctor about the pros and cons of getting tested for it. Although the gene that causes tumors in people with the MEN1 syndrome has been found, the results of genetic testing are not always clear cut so it is important that the test is done along with genetic counseling to help you make sense of the results.

Neurofibromatosis type 1

This disease often runs in families and is characterized by many neurofibromas (benign tumors that form in nerves under the skin and in other parts of the body). It is caused by defects in the *NF1* gene. Some people with this condition also develop carcinoid tumors of the small intestines.

Other genetic syndromes

Carcinoid tumors are also more common among people with tuberous sclerosis complex, von Hippel Lindau disease and familial small intestinal neuroendocrine tumor.

- Tuberous sclerosis complex can be caused by a defect in the *TSC1* or *TSC2* gene. People with this condition can also develop tumors of the heart, eyes, brain, lungs, and skin.
- People with von Hippel Lindau disease have an inherited tendency to develop blood vessel tumors of the brain, spinal cord, or retina, as well as kidney cancer. It is caused by changes in the *VHL* gene.
- A newly discovered condition called familial small intestinal neuroendocrine tumor has been found which is caused by a change in the *IPMK* gene. People with this gene defect have a higher risk of developing carcinoid tumors in the small intestine (bowel).

To find out more on being tested for genetic syndromes, see Genetic Testing: What You Need to Know[1].

Race and gender

Carcinoid tumors are more common among African Americans than whites. Outcomes are also not as good for African Americans. Researchers do not yet know why. Carcinoid tumors are also slightly more common in women than men.

Other stomach conditions

People with certain diseases that damage the stomach and reduce the amount of acid it makes (such as atrophic gastritis or Zollinger-Ellison syndrome) have a greater risk of developing stomach carcinoid tumors, but their risk for carcinoid tumors of other organs is not affected.

Family history of any type of cancer

Having a family history of any cancer, specifically in a first-degree relative (sibling, parent, or child), or a family history of a neuroendocrine tumor or carcinoid tumor seems to raise the risk of developing a carcinoid tumor.

Factors with uncertain or unproven effects

Smoking

It is not clear if smoking[2] increases the risk of getting a carcinoid tumor. Further studies are needed.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/genetics.html
2. www.cancer.org/healthy/stay-away-from-tobacco.html
3. https://www.cancer.gov/types/gi-carcinoid-tumors/hp/gi-carcinoid-treatment-pdq#section/_21

References

Benafif S and Eeles R. Diagnosis and Management of Hereditary Carcinoids. *Recent Results Cancer Res*. 2016; 205:149-68. doi: 10.1007/978-3-319-29998-3_9.

Hassan MM, Phan A, Li D, Dagohoy CG, Leary C, Yao JC. Family history of cancer and associated risk of developing neuroendocrine tumors: a case-control study. *Cancer Epidemiol Biomarkers Prev*. 2008 Apr;17(4):959-65. doi: 10.1158/1055-9965.EPI-07-0750.

Hassan MM, Phan A, Li D, Dagohoy CG, Leary C, Yao JC. Risk factors associated with neuroendocrine tumors: A U.S.-based case-control study. *Int J Cancer*. 2008 Aug 15;123(4):867-73. doi: 10.1002/ijc.23529.

Kaerlev L, Teglbjaerg PS, Sabroe S, et al. The importance of smoking and medical history for development of small bowel carcinoid tumor: a European population-based case-control study. *Cancer Causes Control*. 2002;13:27–34.

Modlin IM, Lye KD, Kidd M. A 5-decade analysis of 13,715 carcinoid tumors. *Cancer*. 2003; 97:934–959.

National Cancer Institute Physician Data Query (PDQ). Gastrointestinal Carcinoid Tumors Treatment (PDQ®)–Health Professional Version. 2018. Accessed at

https://www.cancer.gov/types/gi-carcinoid-tumors/hp/gi-carcinoid-treatment-pdq#section/_21 (www.cancer.gov/types/gi-carcinoid-tumors/hp/gi-carcinoid-treatment-pdq#section/_21)[3] on July 31, 2018.

Norton JA and Kunz PL. Carcinoid) Tumors and the Carcinoid Syndrome. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015:1218–-1226.

Schneider DF, Mazeh H, Lubner SJ, Jaume JC, Chen H. Cancer of the Endocrine System. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa: Elsevier; 2014:1112-1142.

See all references for Gastrointestinal Carcinoid Tumor (www.cancer.org/cancer/gastrointestinal-carcinoid-tumor/references.html)

Last Medical Review: September 24, 2018 Last Revised: September 24, 2018

What Causes Gastrointestinal Carcinoid Tumors?

Cancers can be caused by DNA mutations (changes) that turn on oncogenes or turn off tumor suppressor genes. This leads to cells growing out of control. Changes in many different genes are usually needed to cause carcinoid tumors.

For more about how genes changes can lead to cancer, see Genes and Cancer[1].

Inherited gene mutations

Some DNA mutations can be passed on in families and are found in a person's cells. These areinherited(or **familial**) mutations. A small portion of carcinoid tumors are caused by inherited gene mutations.

Changes in 4 tumor suppressor genes are responsible for many inherited cases of carcinoid tumors.

- ***MEN1*** (multiple neuroendocrine neoplasia 1). Changes in this gene account for most inherited cases. A smaller number are caused by inherited changes in the following genes:
- ***NF1*** (Neurofibromatosis type 1) gene

- ***VHL*** (Von Hippel–Lindau) gene
- ***TSC1 or TSC2*** (tuberous sclerosis complex 1 or 2) genes

Most carcinoid tumors are caused by sporadic changes (mutations) in oncogenes or tumor suppressor genes. Mutations are called **sporadic** if they occur after a person is born, rather than having been inherited.

Hyperlinks

1. www.cancer.org/cancer/cancer-causes/genetics/genes-and-cancer.html

References

Benafif S and Eeles R. Diagnosis and Management of Hereditary Carcinoids. *Recent Results Cancer Res*. 2016; 205:149-68. doi: 10.1007/978-3-319-29998-3_9.

Norton JA and Kunz PL. Carcinoid) Tumors and the Carcinoid Syndrome. In: DeVita VT, Hellman S, Rosenberg SA, eds. *Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015:1218–-1226.

See all references for Gastrointestinal Carcinoid Tumor (www.cancer.org/cancer/gastrointestinal-carcinoid-tumor/references.html)

Last Medical Review: September 24, 2018 Last Revised: September 24, 2018

Can Gastrointestinal Carcinoid Tumors Be Prevented?

At this time, there is no known way to prevent gastrointestinal carcinoid tumors. Since smoking might increase the risk of carcinoid tumors of the small intestine, not starting or quitting smoking may reduce the risk for this disease. More studies are needed to know for sure.

References

Hassan MM, Phan A, Li D, Dagohoy CG, Leary C, Yao JC. Risk factors associated with neuroendocrine tumors: A U.S.-based case-control study. *Int J Cancer*. 2008 Aug 15;123(4):867-73. doi: 10.1002/ijc.23529.

Kaerlev L, Teglbjaerg PS, Sabroe S, et al. The importance of smoking and medical history for development of small bowel carcinoid tumor: a European population-based case-control study. *Cancer Causes Control*. 2002;13:27–34.

See all references for Gastrointestinal Carcinoid Tumor (www.cancer.org/cancer/gastrointestinal-carcinoid-tumor/references.html)

Last Medical Review: September 24, 2018 Last Revised: September 24, 2018

Written by

The American Cancer Society medical and editorial content team (www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

Our team is made up of doctors and oncology certified nurses with deep knowledge of cancer care as well as journalists, editors, and translators with extensive experience in medical writing.