



Stomach Cancer 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 stomach cancer.

- [What Are the Risk Factors for Stomach Cancer?](#)
- [Do We Know What Causes Stomach Cancer?](#)

Prevention

There is no sure way to prevent stomach cancer. But there are things you can do that might lower your risk. Learn more.

- [Can Stomach Cancer Be Prevented?](#)

Stomach Cancer Risk Factors

A risk factor is anything that affects 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.

But, having a risk factor, or even several risk factors, does not mean that you will get the disease. And many people who get the disease may have few or no known risk factors.

Scientists have found several risk factors that make a person more likely to get stomach cancer. Some of these can be controlled, but others cannot.

Gender

Stomach cancer is more common in men than in women.

Age

There is a sharp increase in stomach cancer rates in people over age 50. Most people diagnosed with stomach cancer are between their late 60s and 80s.

Ethnicity

In the United States, stomach cancer is more common in Hispanic Americans, African Americans, Native Americans, and Asian/Pacific Islanders than it is in non-Hispanic whites.

Geography

Worldwide, stomach cancer is more common in Japan, China, Southern and Eastern Europe, and South and Central America. This disease is less common in Northern and Western Africa, South Central Asia, and North America.

Helicobacter pylori infection

Infection with *Helicobacter pylori* (*H pylori*) bacteria seems to be a major [cause of stomach cancer](#), especially cancers in the lower (distal) part of the stomach. Long-term infection of the stomach with this germ may lead to inflammation (called **chronic atrophic gastritis**) and pre-cancerous changes of the inner lining of the stomach.

People with stomach cancer have a higher rate of *H pylori* infection than people without this cancer. *H pylori* infection is also linked to some types of lymphoma of the stomach. Even so, most people who carry this germ in their stomach never develop cancer.

Stomach lymphoma

People who have had a certain type of lymphoma of the stomach known as **mucosa-associated lymphoid tissue (MALT) lymphoma** have an increased risk of getting

adenocarcinoma of the stomach. This is probably because MALT lymphoma of the stomach is caused by infection with *H pylori* bacteria.

Diet

An increased risk of stomach cancer is seen in people with diets that have large amounts of smoked foods, salted fish and meat, and pickled vegetables. Nitrates and nitrites are substances commonly found in cured meats. They can be converted by certain bacteria, such as *H pylori*, into compounds that have been shown to cause stomach cancer in lab animals.

On the other hand, eating lots of fresh fruits and vegetables appears to lower the risk of stomach cancer.

Tobacco use

[Smoking](#) increases stomach cancer risk, particularly for cancers of the upper portion of the stomach near the esophagus. The rate of stomach cancer is about doubled in smokers.

Being overweight or obese

Being overweight or obese is a possible cause of cancers of the cardia (the upper part of the stomach nearest the esophagus), but the strength of this link is not yet clear.

Previous stomach surgery

Stomach cancers are more likely to develop in people who have had part of their stomach removed to treat non-cancerous diseases such as ulcers. This might be because the stomach makes less acid, which allows more nitrite-producing bacteria to be present. Reflux (backup) of bile from the small intestine into the stomach after surgery might also add to the increased risk. These cancers typically develop many years after the surgery.

Pernicious anemia

Certain cells in the stomach lining normally make a substance called **intrinsic factor**

(IF)that we need to absorb vitamin B12 from foods. People without enough IF may end up with a vitamin B12 deficiency, which affects the body's ability to make new red blood cells and can cause other problems as well. This condition is called pernicious anemia. Along with anemia (too few red blood cells), people with this disease have an increased risk of stomach cancer.

Menetrier disease (hypertrophic gastropathy)

In this condition, excess growth of the stomach lining causes large folds in the lining and leads to low levels of stomach acid. Because this disease is very rare, it is not known exactly how much this increases the risk of stomach cancer.

Type A blood

Blood type groups refer to certain substances that are normally present on the surface of red blood cells and some other types of cells. These groups are important in matching blood for transfusions. For unknown reasons, people with type A blood have a higher risk of getting stomach cancer.

Inherited cancer syndromes

Some inherited conditions may raise a person's risk of stomach cancer.

Hereditary diffuse gastric cancer

This inherited syndrome greatly increases the risk of developing stomach cancer. This condition is rare, but the lifetime stomach cancer risk among affected people is about 70% to 80%. Women with this syndrome also have an increased risk of getting a certain type of [breast cancer](#). This condition is caused by mutations (defects) in the *CDH1* gene.

Lynch syndrome or hereditary non-polyposis colorectal cancer (HNPCC)

Lynch syndrome (formerly known as HNPCC) is an inherited genetic disorder that increases the risk of [colorectal cancer](#), stomach cancer, and some other cancers. In most cases, this disorder is caused by a defect in either the *MLH1* or *MSH2* gene, but other [genes](#) can cause Lynch syndrome, including *MLH3*, *MSH6*, *TGFBR2*, *PMS1*, and

PMS2.

Familial adenomatous polyposis (FAP)

In FAP, people get many polyps in the colon, and sometimes in the stomach and intestines as well. People with this syndrome are at greatly increased risk of getting [colorectal cancer](#) and have a slightly increased risk of getting stomach cancer. It is caused by mutations in the *APC* gene.

BRCA1 and BRCA2

People who carry mutations of the inherited [breast cancer genes](#) *BRCA1* or *BRCA2* may also have a higher rate of stomach cancer.

Li-Fraumeni syndrome

People with this syndrome have an increased risk of several types of cancer, including developing stomach cancer at a relatively young age. Li-Fraumeni syndrome is caused by a mutation in the *TP53* gene.

Peutz-Jeghers syndrome (PJS)

People with this condition develop polyps in the stomach and intestines, as well as in other areas including the nose, the airways of the lungs, and the bladder. The polyps in the stomach and intestines are a special type called **hamartomas**. They can cause problems like bleeding or blockage of the intestines. PJS can also cause dark freckle-like spots on the lips, inner cheeks and other areas. People with PJS have an increased risk of cancers of the breast, colon, [pancreas](#), stomach, and several other organs. This syndrome is caused by mutations in the gene *STK1*.

A family history of stomach cancer

People with first-degree relatives (parents, siblings, or children) who have had stomach cancer are more likely to develop this disease.

Some types of stomach polyps

Polyps are non-cancerous growths on the lining of the stomach. Most types of polyps

(such as hyperplastic polyps or inflammatory polyps) do not seem to increase a person's risk of stomach cancer, but adenomatous polyps – also called *adenomas* – can sometimes develop into cancer.

Epstein-Barr virus (EBV) infection

Epstein-Barr virus causes infectious mononucleosis (also called mono). Almost all adults have been infected with this virus at some time in their lives, usually as children or teens.

EBV has been linked to some forms of [lymphoma](#). It is also found in the cancer cells of about 5% to 10% of people with stomach cancer. These people tend to have a slower growing, less aggressive cancer with a lower tendency to spread. EBV has been found in some stomach cancer cells, but it isn't yet clear if this virus actually causes stomach cancer.

Certain occupations

Workers in the coal, metal, and rubber industries seem to have a higher risk of getting stomach cancer.

Common variable immune deficiency (CVID)

People with CVID have an increased risk of stomach cancer. The immune system of someone with CVID can't make enough antibodies in response to germs. People with CVID have frequent infections as well as other problems, including atrophic gastritis and pernicious anemia. They are also more likely to get gastric lymphoma and stomach cancer.

- [References](#)

Avital I, Stojadinovic A, Pisters PWT, Kelsen DP, Willett CG. Cancer of the stomach, In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Capelle LG, de Vries AC, Looman CW, et al. Gastric MALT lymphoma: Epidemiology and high adenocarcinoma risk in a nation-wide study. *Eur J Cancer*. 2008;44:2470–2476.

Chun N, Ford JM. Genetic testing in stomach cancer, In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Dhalla F, da Silva SP, Lucas M, Travis S, Chapel H. Review of gastric cancer risk factors in patients with common variable immunodeficiency disorders, resulting in a proposal for a surveillance programme. *Clin Exp Immunol*. 2011;165:17.

Howlander N, Noone AM, Krapcho M, Miller D, Bishop K, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). *SEER Cancer Statistics Review, 1975-2014*, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2014/, based on November 2016 SEER data submission, posted to the SEER web site, April 2017.

Kaurah P, Huntsman DG. Hereditary diffuse gastric cancer, In: Adam MP, Ardinger HH, Pagon RA, et al., eds. *GeneReviews®* [Internet]. 1993-2017 [Updated 2014]. Accessed at <https://www.ncbi.nlm.nih.gov/books/NBK1139/> on November 27, 2017.

Masciari S, Dewanwala A, Stoffel EM, et al. Gastric cancer in individuals with Li-Fraumeni syndrome. *Genet Med*. 2011;13:651–657.

Online Mendelian Inheritance in Man® (OMIM). *Lynch syndrome*. Accessed at <https://omim.org/entry/120435?search=lynch&highlight=lynch> on November 27, 2017.

Online Mendelian Inheritance in Man® (OMIM). *Peutz-Jeghers syndrome*. Accessed at <https://omim.org/entry/175200?search=Peutz-Jeghers&highlight=peutz%20peutzjegher%20jegher> on November 27, 2017.

Sousa H, Pinto-Correia AL, Medeiros R, Dinis-Ribeiro M. Epstein-Barr virus is associated with gastric carcinoma: The question is what is the significance? *World J Gastroenterol*. 2008;14:4347–4351.

Yang P, Zhou Y, Chen B, et al. Overweight, obesity and gastric cancer risk: Results from a meta-analysis of cohort studies. *Eur J Cancer*. 2009;45:2867–2873.

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What Causes Stomach Cancer?

There are many known [risk factors](#) for stomach cancer, but it is not known exactly how these factors cause cells of the stomach lining to become cancerous. This is the subject of ongoing research.

Several changes thought to be pre-cancerous can occur in the stomach lining.

In **chronic atrophic gastritis**, the normal glands of the stomach are either decreased or absent. There is also some degree of inflammation (the stomach cells are damaged by cells of the immune system). Atrophic gastritis is often caused by *H pylori* infection. It can also be caused by an autoimmune reaction, in which a person's immune system attacks the cells lining the stomach. Some people with this condition go on to develop pernicious anemia or other stomach problems, including cancer. It is not known exactly how this condition might progress to cancer.

Another possible pre-cancerous change is **intestinal metaplasia**. In this condition, the normal lining of the stomach is replaced with cells that closely resemble the cells that usually line the intestine. People with this condition usually have chronic atrophic gastritis as well. How and why this change occurs and progresses to stomach cancer is not well understood. This might also be related to *H pylori* infection.

Recent research has provided clues on how some stomach cancers form. For instance, *H pylori* bacteria, particularly certain subtypes, can convert substances in some foods into chemicals that cause mutations (changes) in the DNA of the cells in the stomach lining. This may also explain why certain foods such as preserved meats increase a person's risk for stomach cancer. On the other hand, some of the foods that might lower stomach cancer risk, such as fruits and vegetables, contain antioxidants that can block substances that damage a cell's DNA.

Scientists have made a lot of progress in understanding how certain changes in DNA can cause normal stomach cells to grow abnormally and form cancers. DNA is the chemical in cells that carries our genes, which control how our cells function. We look like our parents because they are the source of our DNA. But DNA affects more than how we look.

Some genes control when cells grow and divide into new cells:

- Genes that help cells grow and divide are called **oncogenes**.
- Genes that help keep cell division under control or cause cells to die at the right

time are called **tumor suppressor genes**.

DNA changes that turn on oncogenes or turn off tumor suppressor genes can cause cancers.

Inherited mutations (abnormal changes) in some genes (as explained in [Stomach Cancer Risk Factors](#)) can increase a person's stomach cancer risk. These are thought to cause only a small percentage of stomach cancers. Still, genetic testing can be done to look for the gene mutations that can cause some inherited cancer syndromes. You can read more in [Genetics and Cancer](#).

Most of the gene changes that lead to stomach cancer occur after birth. Some of these changes might be caused by risk factors such as *H pylori* infection or tobacco use. But other gene changes may just be random events that sometimes happen inside cells, without having an outside cause.

- [References](#)

Avital I, Stojadinovic A, Pisters PWT, Kelsen DP, Willett CG. Cancer of the stomach, In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Gunderson LL, Donohue JH, Alberts SR, Ashman JB, Jaroszewski DE. Cancer of the Stomach and Gastroesophageal Junction. In: Niederhuber, JE, Armitage, JO, Doroshow, JH, Kastan, MB, Tepper, JE, eds. In *Abeloff's Clinical Oncology*. 5th ed. Philadelphia, Pa: Elsevier; 2014:1240-1270.

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Can Stomach Cancer Be Prevented?

There is no sure way to prevent stomach cancer, but there are things you can do that could lower your risk.

Diet, nutrition, body weight, and physical activity

The dramatic decline of stomach cancer in the past several decades is thought to be a result of people reducing many of the known dietary risk factors. This includes greater use of refrigeration for food storage rather than preserving foods by salting, pickling, and smoking. To help reduce your risk, avoid a diet that is high in smoked and pickled foods and salted meats and fish.

A diet high in fresh fruits and vegetables can also lower stomach cancer risk. Citrus fruits (such as oranges, lemons, and grapefruit) may be especially helpful, but grapefruit and grapefruit juice can change the blood levels of certain drugs you take, so it's important to discuss this with your health care team before adding grapefruit to your diet.

The American Cancer Society recommends that people eat a healthy diet, with an emphasis on plant foods. This includes eating at least 2½ cups of vegetables and fruits every day. Choosing whole-grain breads, pastas, and cereals instead of refined grains, and eating fish, poultry, or beans instead of processed meat and red meat may also help lower your risk of cancer.

Studies that have looked at using dietary supplements to lower stomach cancer risk have had mixed results so far. Some studies have suggested that combinations of antioxidant supplements (vitamins A, C, and E and the mineral selenium) might reduce the risk of stomach cancer in people with poor nutrition to begin with. But most studies looking at people who have good nutrition have not found any benefit to adding vitamin pills to their diet. Further research in this area is needed.

Although some small studies suggested that drinking tea, particularly green tea, may help protect against stomach cancer, most large studies have not found such a link.

Being overweight or obese may add to the risk of stomach cancer. On the other hand, being physically active may help lower your risk.

The American Cancer Society recommends staying at a healthy weight throughout life by balancing calorie intake with physical activity. Aside from possible effects on the risk of stomach cancer, losing weight and being active may also have an effect on the risk of several other cancers and health problems. The full recommendations can be found in the [American Cancer Society Guidelines on Nutrition and Physical Activity for Cancer Prevention](#).

Avoiding tobacco use

Tobacco use can increase the risk of cancers of the proximal stomach (the portion of

the stomach closest to the esophagus). Tobacco use increases the risk for many other types of cancer and is responsible for about one-third of all cancer deaths in the United States. If you don't use tobacco, don't start. If you already do and [want help quitting](#), call the American Cancer Society at 1-800-227-2345.

Treating *H pylori* infection

It is not yet clear if people whose stomach linings are chronically infected with the *H pylori* bacteria but who do not have any symptoms should be treated with antibiotics. This is a topic of current research. Some early studies have suggested that giving antibiotics to people with *H pylori* infection might lower the number of pre-cancerous lesions in the stomach and reduce the risk of developing stomach cancer. But not all studies have found this. More research is needed to be sure that this is a way to prevent stomach cancer in people with *H pylori* infection.

If your doctor thinks you might have *H pylori* infection, there are several ways to test for this:

- The simplest way is a blood test that looks for antibodies to *H pylori*. Antibodies are proteins the body's immune system makes in response to an infection. A positive *H pylori* antibody test result can mean either that you are infected with *H pylori* or that you had an infection in the past that is now cleared.
- Another approach is to have an endoscopy procedure (see [Tests for Stomach Cancer](#)) to take a biopsy sample of the stomach lining. This sample can be used for chemical tests for this kind of bacteria. Doctors can also identify *H pylori* in biopsy samples seen with a microscope. The biopsy sample can also be cultured (placed in a substance that promotes bacterial growth) to see if *H pylori* grows out of the sample.
- There is also a special breath test for the bacteria. For this test, you drink a liquid containing urea. If *H pylori* is present, it will chemically change the urea. A sample of your breath is then tested for these chemical changes.

Aspirin use

Using aspirin or other non-steroidal anti-inflammatory drugs (NSAIDs) such as ibuprofen or naproxen, seems to lower the risk of stomach cancer. These medicines can also lower the risk of developing colon polyps and [colon cancer](#). But they can also cause serious (and even life-threatening) internal bleeding and other potential health risks in some people.

Most doctors consider any reduced cancer risk an added benefit for patients who take these drugs for other reasons, such as to treat arthritis. But doctors do not routinely recommend taking NSAIDs specifically to prevent stomach cancer. Studies have not yet determined for which patients the benefits of lowering cancer risk would outweigh the risks of bleeding complications.

For people at greatly increased risk

Only a small percentage of stomach cancers are known to be caused by **hereditary diffuse gastric cancer syndrome**. But it's very important to recognize it, because most people who inherit this condition eventually get stomach cancer. A personal history of invasive lobular [breast cancer](#) before age 50 as well as having close family members who have had stomach cancer suggests that they might be at risk for having this syndrome. These people can talk to a genetics professional about getting [genetic testing](#). If the testing shows the person has a mutation (abnormal change) in the *CDH1* gene, many doctors will recommend they have their stomach removed before the cancer develops. Another hereditary cancer syndrome with an increased risk for stomach cancer is **Lynch syndrome**.

- [References](#)

Bae J, Lee E, Guyatt G. Citrus fruit intake and stomach cancer risk: A quantitative systematic review. *Gastric Cancer*. 2008;11:23–32.

Benusiglio PR, Malka D, Rouleau E, et al. CDH1 germline mutations and the hereditary diffuse gastric and lobular breast cancer syndrome: a multicentre study. *J Med Genet*. 2013 Jul;50(7):486-9. Epub 2013 May 25.

Chun N, Ford JM. Genetic testing in stomach cancer, In: DeVita VT, Lawrence TS, Rosenberg SA, eds. *DeVita, Hellman, and Rosenberg's Cancer: Principles and Practice of Oncology*. 10th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2015.

Kushi LH, Doyle C, McCullough M, Rock CL, Demark-Wahnefried W, Bandera EV, Gapstur S, Patel AV, Andrews K, Gansler T; American Cancer Society 2010 Nutrition and Physical Activity Guidelines Advisory Committee. American Cancer Society Guidelines on nutrition and physical activity for cancer prevention: reducing the risk of cancer with healthy food choices and physical activity. *CA Cancer J Clin*. 2012 Jan-Feb;62(1):30-67.

National Cancer Institute. Physician Data Query (PDQ). Gastric Cancer Screening. 3/10/2017. Accessed at <https://www.cancer.gov/types/stomach/hp/stomach-screening-pdq> on November 27, 2017.

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