What is prevention?

Cancer prevention is action taken to lower the chance of getting cancer. By preventing cancer, the number of new cases of cancer in a group or population is lowered. Hopefully, this will lower the number of deaths caused by cancer.

To prevent new cancers from starting, scientists look at risk factors and protective factors. Anything that increases your chance of developing cancer is called a cancer risk factor; anything that decreases your chance of developing cancer is called a cancer protective factor.

Some risk factors for cancer can be avoided, but many cannot. For example, both smoking and inheriting certain genes are risk factors for some types of cancer, but only smoking can be avoided. Regular exercise and a healthy diet may be protective factors for some types of cancer. Avoiding risk factors and increasing protective factors may lower your risk, but it does not mean that you will not get cancer.

Different ways to prevent cancer are being studied, including:

- Changing lifestyle or eating habits.
- Avoiding things known to cause cancer.
- Taking medicines to treat a precancerous condition or to keep cancer from starting.

General Information About Liver (Hepatocellular) Cancer

<table>
<thead>
<tr>
<th>Key Points for This Section</th>
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<tr>
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Liver cancer is a disease in which malignant (cancer) cells form in the tissues of the liver. The liver is one of the largest organs in the body. It has four lobes and fills the upper right side of the abdomen inside the rib cage. The liver has many important functions, including:

- Filtering harmful substances from the blood so they can be passed from the body in stools and urine.
- Making bile to help digest fats from food.
- Storing glycogen (sugar), which the body uses for energy.

See the following PDQ summaries for more information about liver (hepatocellular) cancer:

- Liver (Hepatocellular) Cancer Screening
- Adult Primary Liver Cancer Treatment
- Childhood Liver Cancer Treatment

Liver cancer is not common in the United States.

Liver cancer is the fourth most common cancer and the third leading cause of cancer death in the world. In the United States, men, especially Chinese American men, have an increased risk of liver cancer. The number of new cases of liver cancer and the number of deaths from liver cancer continue to increase, especially among middle-aged black, Hispanic, and white men. People are usually older than 40 years when they develop this cancer.

Finding and treating liver cancer early may prevent death from liver cancer.

Being infected with certain types of the hepatitis virus can cause hepatitis and increase the risk of liver cancer.

Hepatitis is most commonly caused by the hepatitis virus. Hepatitis is a disease that causes inflammation (swelling) of the liver. Damage to the liver from hepatitis that lasts a long time can increase the risk of liver cancer.

There are six types of the hepatitis virus. Hepatitis A (HAV), hepatitis B (HBV), and hepatitis C (HCV) are the three most common types. These three viruses cause similar symptoms, but the ways they spread and affect the liver are different.

The Hepatitis A vaccine and the hepatitis B vaccine prevent infection with hepatitis A and hepatitis B. There is no vaccine to prevent infection with hepatitis C. If a person has had one type of hepatitis in the past, it is still possible to get the other types.

Hepatitis viruses include:

**Hepatitis A**

Hepatitis A is caused by eating food or drinking water infected with hepatitis A virus. It does not lead to chronic disease. People with hepatitis A usually get better without treatment.

**Hepatitis B**

Hepatitis B is caused by contact with the blood, semen, or other body fluid of a person infected with hepatitis B virus. It is a serious infection that may become chronic and cause scarring of the liver (cirrhosis). This may lead to liver cancer. Blood banks test all donated blood for hepatitis B, which greatly lowers the risk of getting the virus from blood transfusions.

**Hepatitis C**

Hepatitis C is caused by contact with the blood of a person infected with hepatitis C virus. Hepatitis C may
range from a mild illness that lasts a few weeks to a serious, lifelong illness. Most people who have hepatitis C develop a chronic infection that may cause scarring of the liver (cirrhosis). This may lead to liver cancer. Blood banks test all donated blood for hepatitis C, which greatly lowers the risk of getting the virus from blood transfusions.

**Hepatitis D**

Hepatitis D develops in people already infected with hepatitis B. It is caused by hepatitis D virus (HDV) and is spread through contact with infected blood or dirty needles, or by having unprotected sex with a person infected with HDV. Hepatitis D causes acute hepatitis.

**Hepatitis E**

Hepatitis E is caused by hepatitis E virus (HEV). Hepatitis E can be spread through oral-anal contact or by drinking infected water. Hepatitis E is rare in the United States.

**Hepatitis G**

Being infected with hepatitis G virus (HGV) has not been shown to cause liver cancer.

**Liver (Hepatocellular) Cancer Prevention**

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**Avoiding risk factors and increasing protective factors may help prevent cancer.**

Avoiding cancer risk factors such as smoking, being overweight, and lack of exercise may help prevent certain cancers. Increasing protective factors such as quitting smoking, eating a healthy diet, and exercising may also help prevent some cancers. Talk to your doctor or other health care professional about how you might lower your risk of cancer.

**The following risk factors may increase the risk of liver cancer:**

**Hepatitis B and C**

Having chronic hepatitis B or chronic hepatitis C increases the risk of developing liver cancer. The risk is even greater for people with both hepatitis B and C. Also, the longer the hepatitis infection lasts (especially hepatitis C), the greater the risk.

In a study of patients with chronic hepatitis C, those who were treated to lower their iron levels by having blood drawn and eating a low-iron diet were less likely to develop liver cancer than those who did not have this treatment.

**Cirrhosis**
The risk of developing liver cancer is increased for people who have cirrhosis, a disease in which healthy liver tissue is replaced by scar tissue. The scar tissue blocks the flow of blood through the liver and keeps it from working as it should. Chronic alcoholism and chronic hepatitis C are the most common causes of cirrhosis.

**Aflatoxin**

The risk of developing liver cancer may be increased by eating foods that contain aflatoxin (poison from a fungus that can grow on foods, such as grains and nuts, that have not been stored properly).

**The following protective factor may decrease the risk of liver cancer:**

**Hepatitis B vaccine**

Preventing hepatitis B infection (by being vaccinated for hepatitis B) has been shown to lower the risk of liver cancer in children. It is not yet known if it lowers the risk in adults.

**Cancer prevention clinical trials are used to study ways to prevent cancer.**

Cancer prevention clinical trials are used to study ways to lower the risk of developing certain types of cancer. Some cancer prevention trials are conducted with healthy people who have not had cancer but who have an increased risk for cancer. Other prevention trials are conducted with people who have had cancer and are trying to prevent another cancer of the same type or to lower their chance of developing a new type of cancer. Other trials are done with healthy volunteers who are not known to have any risk factors for cancer.

The purpose of some cancer prevention clinical trials is to find out whether actions people take can prevent cancer. These may include eating fruits and vegetables, exercising, quitting smoking, or taking certain medicines, vitamins, minerals, or food supplements.

**New ways to prevent liver cancer are being studied in clinical trials.**

Clinical trials are taking place in many parts of the country. Information about clinical trials can be found in the Clinical Trials section of the NCI Web site. Check NCI's PDQ Cancer Clinical Trials Registry for liver cancer prevention trials that are now accepting patients.

**Get More Information From NCI**

**Call 1-800-4-CANCER**

For more information, U.S. residents may call the National Cancer Institute's (NCI's) Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237) Monday through Friday from 9:00 a.m. to 4:30 p.m. A trained Cancer Information Specialist is available to answer your questions.

**Chat online**

The NCI's LiveHelp® online chat service provides Internet users with the ability to chat online with an Information Specialist. The service is available from 9:00 a.m. to 11:00 p.m. Eastern time, Monday through Friday. Information Specialists can help Internet users find information on NCI Web sites and answer questions about cancer.

**Write to us**

For more information from the NCI, please write to this address:

NCI Public Inquiries Office  
Suite 3036A  
6116 Executive Boulevard, MSC8322  
Bethesda, MD 20892-8322
Search the NCI Web site

The NCI Web site provides online access to information on cancer, clinical trials, and other Web sites and organizations that offer support and resources for cancer patients and their families. For a quick search, use the search box in the upper right corner of each Web page. The results for a wide range of search terms will include a list of "Best Bets," editorially chosen Web pages that are most closely related to the search term entered.

There are also many other places to get materials and information about cancer treatment and services. Hospitals in your area may have information about local and regional agencies that have information on finances, getting to and from treatment, receiving care at home, and dealing with problems related to cancer treatment.

Find Publications

The NCI has booklets and other materials for patients, health professionals, and the public. These publications discuss types of cancer, methods of cancer treatment, coping with cancer, and clinical trials. Some publications provide information on tests for cancer, cancer causes and prevention, cancer statistics, and NCI research activities. NCI materials on these and other topics may be ordered online or printed directly from the NCI Publications Locator. These materials can also be ordered by telephone from the Cancer Information Service toll-free at 1-800-4-CANCER (1-800-422-6237).

Changes to This Summary (10/09/2009)

The PDQ cancer information summaries are reviewed regularly and updated as new information becomes available. This section describes the latest changes made to this summary as of the date above.

Changes were made to this summary to match those made to the health professional version.

Questions or Comments About This Summary

If you have questions or comments about this summary, please send them to Cancer.gov through the Web site’s Contact Form. We can respond only to email messages written in English.

About PDQ

PDQ is a comprehensive cancer database available on NCI's Web site.

PDQ is the National Cancer Institute's (NCI's) comprehensive cancer information database. Most of the information contained in PDQ is available online at NCI's Web site. PDQ is provided as a service of the NCI. The NCI is part of the National Institutes of Health, the federal government's focal point for biomedical research.

PDQ contains cancer information summaries.

The PDQ database contains summaries of the latest published information on cancer prevention, detection, genetics, treatment, supportive care, and complementary and alternative medicine. Most summaries are available in two versions. The health professional versions provide detailed information written in technical language. The patient versions are written in easy-to-understand, nontechnical language. Both versions provide current and accurate cancer information.

The PDQ cancer information summaries are developed by cancer experts and reviewed regularly.

Editorial Boards made up of experts in oncology and related specialties are responsible for writing and maintaining the cancer information summaries. The summaries are reviewed regularly and changes are made as new information becomes available. The date on each summary ("Date Last Modified") indicates the time of the most recent change.
**PDQ also contains information on clinical trials.**

A clinical trial is a study to answer a scientific question, such as whether a certain drug or nutrient can prevent cancer. Trials are based on past studies and what has been learned in the laboratory. Each trial answers certain scientific questions in order to find new and better ways to help cancer patients and those who are at risk for cancer. During prevention clinical trials, information is collected about the effects of a new prevention method and how well it works. If a clinical trial shows that a new method is better than one currently being used, the new method may become "standard." People who are at high risk for a certain type of cancer may want to think about taking part in a clinical trial.

Listings of clinical trials are included in PDQ and are available online at [NCI's Web site](http://www.nci.nih.gov). Descriptions of the trials are available in health professional and patient versions. Many cancer doctors who take part in clinical trials are also listed in PDQ. For more information, call the Cancer Information Service 1-800-4-CANCER (1-800-422-6237).

**Glossary Terms**

**abdomen** (AB-doh-men)

The area of the body that contains the pancreas, stomach, intestines, liver, gallbladder, and other organs.

**acute** (uh-KYOOT)

Symptoms or signs that begin and worsen quickly; not chronic.

**aflatoxin** (A-fluh-TOK-sin)

A harmful substance made by certain types of mold (Aspergillus flavus and Aspergillus parasiticus) that is often found on poorly stored grains and nuts. Consumption of foods contaminated with aflatoxin is a risk factor for primary liver cancer.

**alcoholism** (AL-kuh-HAW-LIH-zum)

A disease in which a person craves alcohol, is unable to limit his or her drinking, needs to drink greater amounts to get the same effect, and has withdrawal symptoms after stopping alcohol use. Alcoholism affects physical and mental health, and causes problems with family, friends, and work. Also called alcohol dependence.

**anal** (AY-nul)

Having to do with the anus. The anus is the opening of the rectum (last part of the large intestine) to the outside of the body.

**bile**

A fluid made by the liver and stored in the gallbladder. Bile is excreted into the small intestine, where it helps digest fat.

**blood**

A tissue with red blood cells, white blood cells, platelets, and other substances suspended in fluid called plasma. Blood takes oxygen and nutrients to the tissues, and carries away wastes.

**blood transfusion**

The administration of blood or blood products into a blood vessel.
cancer (KAN-ser)

A term for diseases in which abnormal cells divide without control and can invade nearby tissues. Cancer cells can also spread to other parts of the body through the blood and lymph systems. There are several main types of cancer. Carcinoma is a cancer that begins in the skin or in tissues that line or cover internal organs. Sarcoma is a cancer that begins in bone, cartilage, fat, muscle, blood vessels, or other connective or supportive tissue. Leukemia is a cancer that starts in blood-forming tissue such as the bone marrow, and causes large numbers of abnormal blood cells to be produced and enter the blood. Lymphoma and multiple myeloma are cancers that begin in the cells of the immune system. Central nervous system cancers are cancers that begin in the tissues of the brain and spinal cord. Also called malignancy.

chronic (KRAH-nik)

A disease or condition that persists or progresses over a long period of time.

cirrhosis (seh-ROH-sis)

A type of chronic, progressive liver disease in which liver cells are replaced by scar tissue.

clinical trial (KLIH-nih-kul TRY-ul)

A type of research study that tests how well new medical approaches work in people. These studies test new methods of screening, prevention, diagnosis, or treatment of a disease. Also called clinical study.

diet

The things a person eats and drinks.

fluid (FLOO-id)

A substance that flows smoothly and takes the shape of its container. Liquids and gases are fluids.

fungus (FUN-gus)

A plant-like organism that does not make chlorophyll. Mushrooms, yeasts, and molds are examples. The plural is fungi.

gene

The functional and physical unit of heredity passed from parent to offspring. Genes are pieces of DNA, and most genes contain the information for making a specific protein.

hepatitis (HEH-puh-TY-tis)

Disease of the liver causing inflammation. Symptoms include an enlarged liver, fever, nausea, vomiting, abdominal pain, and dark urine.

hepatitis A vaccine (HEH-puh-TY-tis ... vak-SEEN)

A vaccine used to prevent infection with the hepatitis A virus, which causes a serious liver disease. The vaccine is made of a weakened form of the virus that cannot cause disease but causes the body's immune system to make antibodies that destroy the hepatitis A virus.

hepatitis A virus (HEH-puh-TY-tis ... VY-rus)

A virus that causes a serious liver disease. It is usually spread by contact with an infected person's stool by eating food he or she has handled after not washing hands, but it can be spread in other ways. Symptoms of infection include jaundice, dark urine, and fever and other flu-like symptoms.
hepatitis B virus (HEH-puh-TY-tis ... VY-rus)

A virus that causes hepatitis (inflammation of the liver). It is carried and passed to others through blood or sexual contact. Also, infants born to infected mothers may become infected with the virus.

hepatitis C virus (HEH-puh-TY-tis ... VY-rus)

A virus that causes hepatitis (inflammation of the liver). It is carried and passed to others through blood or sexual contact. Also, infants born to infected mothers may become infected with the virus.

hepatitis D virus (HEH-puh-TY-tis ... VY-rus)

A type of hepatitis virus that may be present in the body at the same time as the hepatitis B virus. It makes the hepatitis (inflammation of the liver) caused by hepatitis B much worse. The hepatitis D virus and the hepatitis B virus are spread to others through blood or sexual contact. Infants born to infected mothers may also become infected with the virus. Also called hepatitis delta virus.

hepatitis E virus (HEH-puh-TY-tis ... VY-rus)

A virus that causes hepatitis (inflammation of the liver). It is usually spread through food that has been handled by an infected person, or through drinking water that is contaminated with human waste.

hepatitis G virus (HEH-puh-TY-tis ... VY-rus)

A virus that may be found in patients with hepatitis (inflammation of the liver). It is spread to others through blood or sexual contact. Infants born to infected mothers may also become infected with the virus.

infection

Invasion and multiplication of germs in the body. Infections can occur in any part of the body and can spread throughout the body. The germs may be bacteria, viruses, yeast, or fungi. They can cause a fever and other problems, depending on where the infection occurs. When the body's natural defense system is strong, it can often fight the germs and prevent infection. Some cancer treatments can weaken the natural defense system.

inflammation (IN-fluh-MAY-shun)

Redness, swelling, pain, and/or a feeling of heat in an area of the body. This is a protective reaction to injury, disease, or irritation of the tissues.

iron (I-urn)

An important mineral the body needs to make hemoglobin, a substance in the blood that carries oxygen from the lungs to tissues throughout the body. Iron is also an important part of many other proteins and enzymes needed by the body for normal growth and development. It is found in red meat, fish, poultry, lentils, beans, and foods with iron added, such as cereal.

liver

A large organ located in the upper abdomen. The liver cleanses the blood and aids in digestion by secreting bile.

liver cancer

Primary liver cancer is cancer that forms in the tissues of the liver. Secondary liver cancer is cancer that spreads to the liver from another part of the body.
A portion of an organ, such as the liver, lung, breast, thyroid, or brain.

**medicine** (MEH-dih-sin)

Refers to the practices and procedures used for the prevention, treatment, or relief of symptoms of a disease or abnormal conditions. This term may also refer to a legal drug used for the same purpose.

**mineral** (MIH-neh-rul)

In medicine, a mineral is a nutrient that is needed in small amounts to keep the body healthy. Mineral nutrients include the elements calcium, magnesium, and iron.

**NCI**


**oral** (OR-ul)

By or having to do with the mouth.

**organ**

A part of the body that performs a specific function. For example, the heart is an organ.

**overweight**

Being too heavy for one’s height. Excess body weight can come from fat, muscle, bone, and/or water retention. Being overweight does not always mean being obese.

**PDQ**

PDQ is an online database developed and maintained by the National Cancer Institute. Designed to make the most current, credible, and accurate cancer information available to health professionals and the public, PDQ contains peer-reviewed summaries on cancer treatment, screening, prevention, genetics, complementary and alternative medicine, and supportive care; a registry of cancer clinical trials from around the world; and directories of physicians, professionals who provide genetics services, and organizations that provide cancer care. Most of this information, and more specific information about PDQ, can be found on the NCI's Web site at [http://www.cancer.gov/cancertopics/pdq](http://www.cancer.gov/cancertopics/pdq). Also called Physician Data Query.

**precancerous** (pre-KAN-ser-us)

A term used to describe a condition that may (or is likely to) become cancer. Also called premalignant.

**prevention** (pree-VEN-shun)

In medicine, action taken to decrease the chance of getting a disease or condition. For example, cancer prevention includes avoiding risk factors (such as smoking, obesity, lack of exercise, and radiation exposure) and increasing protective factors (such as getting regular physical activity, staying at a healthy weight, and having a healthy diet).

**protective factor** (proh-TEK-tiv FAK-ter)

Something that may decrease the chance of getting a certain disease. Some examples of protective factors for cancer are getting regular physical activity, staying at a healthy weight, and having a healthy diet.
**risk factor** (... FAK-ter)

Something that increases the chance of developing a disease. Some examples of risk factors for cancer are age, a family history of certain cancers, use of tobacco products, being exposed to radiation or certain chemicals, infection with certain viruses or bacteria, and certain genetic changes.

**semen**

The fluid that is released through the penis during orgasm. Semen is made up of sperm from the testicles and fluid from the prostate and other sex glands.

**stool**

The material in a bowel movement. Stool is made up of undigested food, bacteria, mucus, and cells from the lining of the intestines. Also called feces.

**supplementation**

Adding nutrients to the diet.

**symptom**

An indication that a person has a condition or disease. Some examples of symptoms are headache, fever, fatigue, nausea, vomiting, and pain.

**tissue** (TISH-oo)

A group or layer of cells that work together to perform a specific function.

**urine** (YOOR-in)

Fluid containing water and waste products. Urine is made by the kidneys, stored in the bladder, and leaves the body through the urethra.

**vaccinated**

Treated with a vaccine.

**vaccine**

A substance or group of substances meant to cause the immune system to respond to a tumor or to microorganisms. A vaccine can help the body recognize and destroy cancer cells or microorganisms.

**virus** (VY-rus)

In medicine, a very simple microorganism that infects cells and may cause disease. Because viruses can multiply only inside infected cells, they are not considered to be alive.

**vitamin** (VY-tuh-min)

A nutrient that the body needs in small amounts to function and stay healthy. Sources of vitamins are plant and animal food products and dietary supplements. Some vitamins are made in the human body from food products. Vitamins are either fat-soluble (can dissolve in fats and oils) or water-soluble (can dissolve in water). Excess fat-soluble vitamins are stored in the body’s fatty tissue, but excess water-soluble vitamins are removed in the urine. Examples are vitamin A, vitamin C, and vitamin E.
### Table of Links

8. [https://cissecure.nci.nih.gov/ncipubs](https://cissecure.nci.nih.gov/ncipubs)
9. [http://cancer.gov/contact/form_contact.aspx](http://cancer.gov/contact/form_contact.aspx)
10. [http://cancer.gov/clinical_trials](http://cancer.gov/clinical_trials)