

Liver Cancer Awareness



WHAT IS LIVER CANCER?

The body is made up of trillions of living cells. Normal body cells grow, divide into new cells, and die in an orderly way. During the early years of a person's life, normal cells divide faster to allow the person to grow. Once the person becomes an adult, most cells divide only to replace worn-out or dying cells or to repair injuries.

Cancer begins when cells in a part of the body start to grow out of control. There are many kinds of cancer, but they all start because of out-of-control growth of abnormal cells.

Cancer cell growth is different from normal cell growth. Instead of dying, cancer cells continue to grow and form new, abnormal cells. Cancer cells can also invade (grow into) other tissues, something that normal cells cannot do. Growing out of control and invading other tissues are what makes a cell a cancer cell.

Cells become cancer cells because of damage to DNA. DNA is in every cell and directs all its actions. In a normal cell, when DNA gets damaged the cell either repairs the damage or the cell dies. In cancer cells, the damaged DNA is not repaired, but the cell doesn't die like it should. Instead, this cell goes on making new cells that the body does not need. These new cells will all have the same damaged DNA as the first abnormal cell does.

People can inherit damaged DNA, but most DNA damage is caused by mistakes that happen while the normal cell is reproducing or by something in our environment. Sometimes the cause of the DNA damage is something obvious, like cigarette smoking. But often no clear cause is found.

In most cases the cancer cells form a tumor. Some cancers, like leukemia, rarely form tumors. Instead, these cancer cells involve the blood and blood-forming organs and circulate through other tissues where they grow.

Cancer cells often travel to other parts of the body through the bloodstream or lymph vessels, and begin to grow and form new tumors. This process is called *metastasis*.

No matter where a cancer may spread, it is always named for the place where it started. For example, breast cancer that has spread to the liver is still breast cancer, not liver cancer. Likewise, prostate cancer that has spread to the bone is metastatic prostate cancer, not bone cancer.

Different types of cancer can behave very differently. For example, lung cancer and breast cancer are very different diseases. They grow at different rates and respond to different treatments. That is why people with cancer need treatment that is aimed at their particular kind of cancer.

Not all tumors are cancerous. Tumors that aren't cancer are called *benign*. Benign tumors can cause problems – they can grow very large and press on healthy organs and tissues. But they cannot grow into (invade) other tissues. Because they can't invade, they also can't spread to other parts of the body (metastasize). These tumors are almost never life threatening.

CAUSES, RISK FACTORS, AND PREVENTION

What are the risk factors for liver cancer?

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 risk factors don't tell us everything. Having a risk factor, or even several risk factors, does not mean that you will get the disease. And some 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 develop hepatocellular carcinoma (HCC).

Gender

Hepatocellular carcinoma is much more common in males than in females. Much of this is probably because of behaviors affecting some of the risk factors described below. The fibrolamellar subtype of HCC is more common in women.

Race/ethnicity

In the United States, Asian Americans and Pacific Islanders have the highest rates of liver cancer, followed by American Indians/Alaska Natives and Hispanics/Latinos, African Americans, and whites.

Chronic viral hepatitis

Worldwide, the most common risk factor for liver cancer is chronic (long-term) infection with hepatitis B virus (HBV) or hepatitis C virus (HCV). These infections lead to cirrhosis of the liver (see above) and are responsible for making liver cancer the most common cancer in many parts of the world.

In the United States, infection with hepatitis C is the more common cause of HCC, while in Asia and developing countries, hepatitis B is more common. People infected with both viruses have a high risk of developing chronic hepatitis, cirrhosis, and liver cancer. The risk is even higher if they are heavy drinkers (at least 6 standard drinks a day).

HBV and HCV can spread from person to person through sharing contaminated needles (such as in drug use), unprotected sex, or childbirth. They can also be passed on through blood transfusions, although this is very rare in the United States since the start of blood product testing for these viruses. In developing countries, children sometimes contract hepatitis B infection from prolonged contact with family members who are infected.

HBV is more likely to cause symptoms, such as a flu-like illness and a yellowing of the eyes and skin (jaundice). But most people recover completely from HBV infection within a few months. Only a very small percentage of adults become chronic carriers (and have a higher risk for liver cancer). Infants and small children who become infected have a higher risk of becoming chronic carriers.

HCV, on the other hand, is less likely to cause symptoms. But most people with HCV develop chronic infections, which are more likely to lead to liver damage or even cancer.

Other viruses, such as the hepatitis A virus and hepatitis E virus, can also cause hepatitis. But people infected with these viruses do not develop chronic hepatitis or cirrhosis, and do not have an increased risk of liver cancer.

Cirrhosis

Cirrhosis is a disease in which liver cells become damaged and are replaced by scar tissue. People with cirrhosis have an increased risk of liver cancer. Most (but not all) people who develop liver cancer already have some evidence of cirrhosis.

There are several possible causes of cirrhosis. Most cases in the United States occur in people who abuse alcohol or have chronic HBV or HCV infections.

Non-alcoholic fatty liver disease, a condition in which people who consume little or no alcohol develop a fatty liver, is common in obese people. People with a type of this disease known as *non-alcoholic steatohepatitis* (NASH) might go on to develop cirrhosis.

Some types of autoimmune diseases that affect the liver can also cause cirrhosis. For example, there is also a disease called *primary biliary cirrhosis* (PBC). PBC seems to be an autoimmune condition, in which the immune system attacks the bile ducts in the liver. This causes the bile ducts to become damaged and even destroyed and can lead to cirrhosis. People with advanced PBC have a high risk of liver cancer.

Certain types of inherited metabolic diseases (see below) can cause problems in the liver that lead to cirrhosis.

Heavy alcohol use

Alcohol abuse is a leading cause of cirrhosis in the United States, which in turn is linked with an increased risk of liver cancer.

Obesity

Being obese (very overweight) increases the risk of developing liver cancer. This is probably because it can result in fatty liver disease and cirrhosis.

Type 2 diabetes

Type 2 diabetes has been linked with an increased risk of liver cancer, usually in patients who also have other risk factors such as heavy alcohol use and/or chronic viral hepatitis. This risk may be increased because people with type 2 diabetes tend to be overweight or obese, which in turn can cause liver problems.

Inherited metabolic diseases

Certain inherited metabolic diseases can lead to cirrhosis.

People with *hereditary hemochromatosis* absorb too much iron from their food. The iron settles in tissues throughout the body, including the liver. If enough iron builds up in the liver, it can lead to cirrhosis and liver cancer.

Other rare diseases that increase the risk of liver cancer include:

- Tyrosinemia
- Alpha1-antitrypsin deficiency
- Porphyria cutanea tarda
- Glycogen storage diseases
- Wilson disease

Aflatoxins

These cancer-causing substances are made by a fungus that contaminates peanuts, wheat, soybeans, ground nuts, corn, and rice. Storage in a moist, warm environment can lead to the growth of this fungus. Although this can occur almost anywhere in the world, it is more common in warmer and tropical countries. Developed countries such as the United States and those in Europe regulate the content of aflatoxins in foods through testing.

Long-term exposure to these substances is a major risk factor for liver cancer. The risk is increased even more in people with hepatitis B or C infections.

Vinyl chloride and thorium dioxide (Thorotrast)

Exposure to these chemicals raises the risk of angiosarcoma of the liver (see the section, "[What is liver cancer?](#)"). It also increases the risk of developing cholangiocarcinoma and hepatocellular cancer, but to a far lesser degree. Vinyl chloride is a chemical used in making some kinds of plastics. Thorotrast is a chemical that in the past was injected into some patients as part of certain x-ray tests. When the cancer-causing properties of these chemicals were recognized, steps were taken to eliminate them or minimize exposure to them. Thorotrast is no longer used, and exposure of workers to vinyl chloride is strictly regulated.

Anabolic steroids

Anabolic steroids are male hormones used by some athletes to increase their strength and muscle mass. Long-term anabolic steroid use can slightly increase the risk of hepatocellular cancer. Cortisone-like steroids, such as hydrocortisone, prednisone, and dexamethasone, do not carry this same risk.

Arsenic

Drinking water contaminated with naturally occurring arsenic, such as that from some wells, over a long period of time increases the risk of some types of liver cancer. This is more common in parts of East Asia, but it might also be a concern in some areas of the United States.

Infection with parasites

Infection with the parasite that causes schistosomiasis can cause liver damage and is linked to liver cancer. This parasite is not found in the US, but infection can occur in Asia, Africa, and South America.

Tobacco use

Smoking increases the risk of getting liver cancer. Former smokers have a lower risk than current smokers, but both groups have a higher risk than those who never smoked.

Factors with unclear effects on liver cancer risk

Birth control pills

In rare cases, birth control pills, also known as *oral contraceptives*, can cause benign tumors called *hepatic adenomas*. But it is not known if they increase the risk of hepatocellular cancer. Some of the studies that have looked at this issue have suggested there may be a link, but most of the studies were not of high quality and looked at types of pills that are no longer used. Current birth control pills use different types of estrogens, different estrogen doses, and different combinations of estrogens with other hormones. It is not known if the newer pills increase liver cancer risk.

EARLY DETECTION, DIAGNOSIS, AND STAGING

Can liver cancer be found early?

It is often hard to find liver cancer early because [signs and symptoms](#) often do not appear until it is in its later stages. Small liver tumors are hard to detect on a physical exam because most of the liver is covered by the right rib cage. By the time a tumor can be felt, it might already be quite large.

There are no widely recommended screening tests for liver cancer in people who are not at increased risk. (Screening is testing for cancer in people without any symptoms.) But testing might be recommended for some people at higher risk.

Many patients who develop liver cancer have long-standing cirrhosis (scar tissue formation from liver cell damage). Doctors may do tests to look for liver cancer if a patient with cirrhosis gets worse for no apparent reason.

For people at higher risk of liver cancer due to cirrhosis (from any cause) or chronic hepatitis B infection (even without cirrhosis), some experts recommend screening for liver cancer with alpha-fetoprotein (AFP) blood tests and ultrasound exams every 6 to 12 months. In some studies, screening was linked to improved survival from liver cancer.

Ultrasound uses sound waves to take pictures of internal organs.

AFP is a protein that can be present at increased levels in patients with liver cancer. But looking at AFP levels isn't a perfect test for liver cancer. Many patients with early liver cancer have normal AFP levels. Also, AFP levels can be increased from other kinds of cancer as well as some non-cancerous liver conditions.

The American Cancer Society does not have recommendations for liver cancer screening.

TREATING LIVER CANCER

How is liver cancer treated?

This information represents the views of the doctors and nurses serving on the American Cancer Society's Cancer Information Database Editorial Board. These views are based on their interpretation of studies published in medical journals, as well as their own professional experience.

The treatment information in this document is not official policy of the Society and is not intended as medical advice to replace the expertise and judgment of your cancer care team. It is intended to help you and your family make informed decisions, together with your doctor.

Your doctor may have reasons for suggesting a treatment plan different from these general treatment options. Don't hesitate to ask him or her questions about your treatment options.

General treatment information

After liver cancer is diagnosed and staged, your cancer care team will discuss your treatment options with you. Depending on your situation, you may have different types of doctors on your treatment team. These doctors may include:

- A surgeon: a doctor who treats diseases with surgery.
- A radiation oncologist: a doctor who treats cancer with radiation therapy.
- A medical oncologist: a doctor who treats cancer with medicines such as chemotherapy.
- A gastroenterologist: a doctor who specializes in treating diseases of the digestive system, including the liver.

Many other specialists may be involved in your care as well, including nurse practitioners, nurses, nutrition specialists, social workers, and other health professionals.

In creating your treatment plan, important factors to consider include the stage (extent) of the cancer and the health of the rest of your liver. But you and your cancer care team will also want to take into account the possible side effects of treatment, your overall health, and the chances of curing the disease, extending life, or relieving symptoms. Based on these factors, your treatment options may include:

- [Surgery](#) (partial hepatectomy or liver transplant)
- [Tumor ablation](#)
- [Tumor embolization](#)
- [Radiation therapy](#)
- [Targeted therapy](#)
- [Chemotherapy](#)

In some cases, doctors may recommend combining more than one of these treatments. It is important to discuss all of your treatment options, including their goals and possible side effects,

with your doctors to help make the decision that best fits your needs. It's also very important to ask questions if there is anything you're not sure about. You can find some good questions to ask in the section "[What should you ask your doctor about liver cancer?](#)"

If time permits, it might also be a good idea to seek a second opinion, especially from doctors experienced in treating liver cancer. A second opinion might provide more information and help you feel more confident about the treatment plan being considered.

The next few sections describe the various types of treatments used for liver cancer. This is followed by a description of the most common approaches used for these cancers based on their stage.

TALKING WITH YOUR DOCTOR

What should you ask your doctor about liver cancer?

As you cope with liver cancer and its treatment, we encourage you to have honest, open discussions with your doctor. Ask any question, no matter how small it might seem. Here are some questions you might want to ask. Be sure to add others as you think of them. Nurses, social workers, and other members of your treatment team might also be able to answer many of your questions.

- What [kind](#) of liver cancer do I have? (Some types of liver cancer carry a better prognosis than others.)
- Where in my liver is the cancer? Has it spread beyond my liver?
- What is my cancer's [stage](#), and what does that mean?
- How well is my liver functioning?
- Will I need other tests before we can decide on treatment?
- Will I need to see other doctors?
- How much experience do you have treating this type of cancer?
- What are my [treatment](#) choices?
- Can the cancer be removed with [surgery](#)?
- What do you recommend and why?
- What is the goal of the treatment?
- What risks or side effects are there to the treatments you suggest?
- What should I do to be ready for treatment?
- How long will treatment last? What will it be like? Where will it be done?
- How will treatment affect my daily activities?
- What are the chances my cancer will recur with these treatment plans?
- What will we do if the treatment doesn't work or if the cancer recurs?

- What type of follow-up will I need after treatment?

In addition to these sample questions, you might want to write down some of your own. For instance, you might want to ask about second opinions or about qualifying for clinical trials.

AFTER TREATMENT

What happens after treatment for liver cancer?

For some people with liver cancer, treatment may remove or destroy the cancer. Completing treatment can be both stressful and exciting. You may be relieved to finish treatment, but find it hard not to worry about cancer growing or coming back. (When cancer comes back after treatment, it is called a *recurrence*.) This is a very common concern in people who have had cancer.

It may take a while before your fears lessen. But it may help to know that many cancer survivors have learned to live with this uncertainty and are leading full lives. Our document [Living With Uncertainty: The Fear of Cancer Recurrence](#), gives more detailed information on this.

For others, liver cancer may never go away completely. You may still get regular treatments to try to help keep the cancer in check. Learning to live with cancer that does not go away can be difficult and very stressful. It has its own type of uncertainty. Our document [When Cancer Doesn't Go Away](#), talks more about this.

Follow-up care

Even after you have completed treatment, your doctors will still need to watch you closely. It is very important to go to all follow-up appointments. During these visits, your doctors will ask about symptoms, do physical exams, and may order blood tests, such as alpha-fetoprotein (AFP) levels, liver function tests (LFTs). Imaging tests, such as ultrasound, CT, or MRI scans might also be ordered.

If you have been treated with a surgical resection or a liver transplant and have no signs of cancer remaining, most doctors recommend follow-up with [imaging tests](#) and blood tests every 3 to 6 months for the first 2 years, then every 6 to 12 months. Follow-up is needed to check for cancer recurrence or spread, as well as possible side effects of certain treatments.

This is the time for you to ask your health care team any questions you need answered and to discuss any concerns you might have.

Almost any cancer treatment can have side effects. Some may last for a few weeks to several months, but others can last the rest of your life. Don't hesitate to tell your cancer care team about any symptoms or side effects that bother you so they can help you manage them effectively.

It is important to keep health insurance. Health care costs a lot, and even though no one wants to think of their cancer coming back, this could happen.

If your cancer does come back, treatment will depend on the location of the cancer, what treatments you've had before, and your overall health and liver function. For more information on how recurrent cancer is treated, see the section "[Treatment of liver cancer, by stage.](#)" For more general information on dealing with a recurrence, you might also want to see the American Cancer Society document [When Your Cancer Comes Back: Cancer Recurrence](#). You can get this document by calling 1-800-227-2345.

Follow-up after a liver transplant

A liver transplant can be very effective at treating the cancer and replacing a damaged liver. But this is a major procedure that requires intense follow-up after treatment. Along with monitoring your recovery from surgery and looking for possible signs of cancer recurrence, your medical team will watch you closely to make sure your body is not rejecting the new liver.

You will need to take strong medicines to help prevent the rejection. These medicines can have their own side effects, including weakening your immune system, which can make you more likely to get [infections](#).

Your transplant team should tell you what to watch for in terms of symptoms and side effects and when you need to contact them. It is very important to follow their instructions closely.

Anti-viral treatment

If you have hepatitis B or C that may have contributed to your liver cancer, your doctor may want to put you on medicines to treat or help control the infection.

Seeing a new doctor

At some point after your cancer diagnosis and treatment, you may find yourself seeing a new doctor who does not know about your medical history. It is important that you can give your new doctor the details of your diagnosis and treatment. Gathering these details soon after treatment may be easier than trying to get them at some point in the future. Make sure you have this information handy:

- A copy of your pathology report(s) from any biopsies or surgeries
- Copies of imaging tests (CT or MRI scans, etc.), which can usually be stored on a CD, DVD, etc.
- If you had surgery, a copy of your operative report(s)
- If you stayed in the hospital, a copy of the discharge summary that doctors prepare when patients are sent home
- If you had radiation therapy, a summary of the type and dose of radiation and when and where it was given
- If you had chemotherapy or targeted therapies, a list of your drugs, drug doses, and when you took them

The doctor may want copies of this information for his records, but always keep copies for yourself.

WHAT'S NEW IN LIVER CANCER RESEARCH?

What's new in liver cancer research and treatment?

Because there are only a few effective ways to prevent or treat liver cancer at this time, there is always a great deal of research going on in the area of liver cancer. Scientists are looking for causes and ways to prevent liver cancer, and doctors are working to improve treatments.

Prevention

The most effective way to reduce the worldwide burden of liver cancer is to prevent it from happening in the first place. Some scientists believe that vaccinations and improved treatments for hepatitis could prevent about half of liver cancer cases worldwide. Researchers are studying ways to prevent or treat hepatitis infections before they cause liver cancers. Research into developing a vaccine to prevent hepatitis C is ongoing. Progress is also being made in treating chronic hepatitis.

Screening

Several new blood tests are being studied to see if they can detect liver cancer earlier than using [AFP and ultrasound](#). One that is promising is called DKK1.

Surgery

Newer techniques are being developed to make both partial hepatectomy and liver transplants safer and more effective.

Adding other treatments to surgery

An active area of research uses *adjuvant* therapies – treatments given right after surgery – to try to reduce the chances that the cancer will return. Most of the studies so far using chemotherapy or chemoembolization after [surgery](#) have not shown that they help people live longer. But newer drugs, may prove to be more effective. Some of the drugs being studied include the targeted drug [sorafenib](#) (Nexavar) and menatetrenone, a drug that is chemically similar to Vitamin K. Some promising results have also been seen with [radioembolization](#), but these need to be confirmed in larger studies.

Doctors are also studying ways to make more liver cancers resectable by trying to shrink them before surgery. Studies are now looking at different types of *neoadjuvant* therapies (therapies given before surgery), including targeted therapy, chemotherapy, ablation, embolization, and radiation therapy. Early results have been promising but have only looked at small numbers of patients.

Laparoscopic surgery

In laparoscopic surgery, several small incisions are made in the abdomen, and special long, thin surgical instruments are inserted to view and cut out the diseased portion of the liver. It does not require a large incision in the abdomen, which means there is less blood loss, less pain after surgery, and a quicker recovery.

At this time, laparoscopic surgery is still considered experimental for liver cancer. It is being studied mainly in patients with small tumors in certain parts of the liver that can be easily reached through the laparoscope.

Determining recurrence risk after surgery

After a partial hepatectomy, one of the biggest concerns is that the cancer might come back (recur). Knowing someone's risk for recurrence after [surgery](#) might give doctors a better idea of how best to follow up with them, and may someday help determine who needs additional treatment to lower this risk.

Researchers may have found a way to do this by testing the cells in the surgery sample. In a recent study, they looked at the pattern of genes in liver cells near the tumor (not the tumor cells themselves) and were able to predict which patients were at higher risk for recurrence. This early finding will need to be confirmed in other studies before it is widely used.

Liver transplant

Only a small portion of patients with liver cancer are candidates for a liver transplant because of the strict criteria they need to meet (based mainly on the size and number of tumors). Some doctors are now looking to see if these criteria can be expanded, so that people who are otherwise healthy but have slightly larger tumors might also be eligible.

Radiation therapy

The main problem with using radiation therapy against liver cancer is that it also damages healthy liver tissue. Researchers are now working on ways to focus radiation therapy more narrowly on the cancer, sparing the nearby normal liver tissue. One approach being studied is called brachytherapy. In this treatment, catheters (thin tubes) are placed in the tumor and then pellets that give off radiation are put into the catheters for a short time. After the treatment, both the pellets and the catheters are removed. This allows radiation to be targeted to the cancer with less harm to the normal liver.

Targeted therapy

New drugs are being developed that work differently from standard chemotherapy drugs. These newer drugs target specific parts of cancer cells or their surrounding environments.

Tumor blood vessels are the target of several newer drugs. Liver tumors need new blood vessels to grow beyond a certain size. The drug [sorafenib](#) (Nexavar), which is already used for some liver cancers that can't be removed surgically, works in part by hindering new blood vessel growth. This drug is now being studied for use earlier in the course of the disease, such as after surgery or trans-arterial chemoembolization (TACE). Researchers are also studying whether combining it with chemotherapy may make it more effective.

Regorafenib (Stivarga[®]) is another targeted drug that is showing promise in treating liver cancers

Chemotherapy

New forms of systemic and regional chemotherapy combined with other treatments are being tested in clinical trials. A small number of tumors respond to chemotherapy, although it has not yet been shown to prolong survival.

Chemotherapy drugs, such as oxaliplatin, capecitabine, gemcitabine, and docetaxel, are being tested against liver cancer in clinical trials. Oxaliplatin has shown promising results in early studies when given in combination with doxorubicin and also when given with gemcitabine and the targeted therapy drug cetuximab (Erbix[®]).

If you'd like more information on a drug used in your treatment or a specific drug mentioned in this section, see our [Guide to Cancer Drugs](#) on our website, or call us with the names of the medicines you're taking.

Virus therapy

A newer approach to treatment is the use of a virus, known as *JX-594*. This started as the same virus that was used to make the smallpox vaccine, but it has been altered in the lab so that it mainly infects cancer cells and not normal cells. A solution containing the virus is injected into liver cancers, and the virus can enter the cancer cells, where it causes them to die or to make proteins that result in them being attacked by the body's immune system. Early results of this treatment against advanced liver cancer have been promising, even in patients who have already had other treatments.

Source

