



[cancer.org](https://www.cancer.org) | 1.800.227.2345

About Liver Cancer

Overview and Types

If you have been diagnosed with liver cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- [What Is Liver Cancer?](#)

Research and Statistics

See the latest estimates for new cases of liver cancer and deaths in the US and what research is currently being done.

- [Key Statistics About Liver Cancer](#)
 - [What's New in Liver Cancer Research?](#)
-

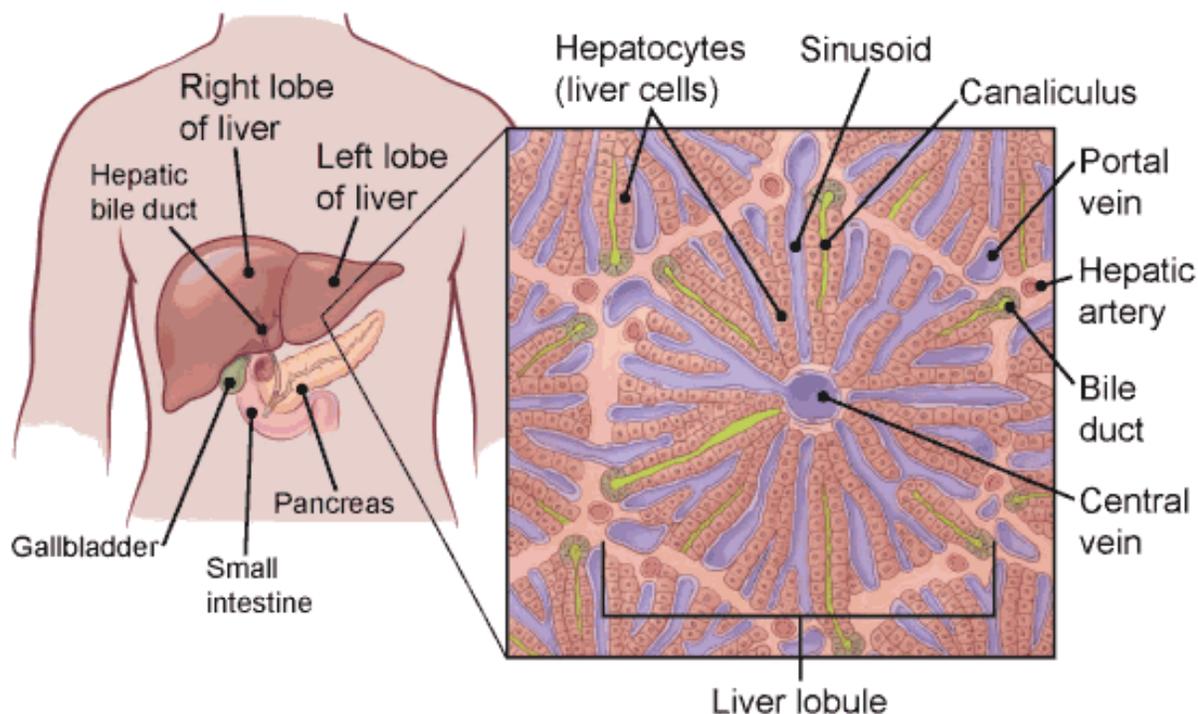
What Is Liver Cancer?

Liver cancer is a type of cancer that starts in the liver. Cancer starts when cells in the body begin to grow out of control. To learn more about how cancers start and spread, see [What Is Cancer?](#)¹

To understand liver cancer, it helps to know about the normal structure and function of the liver.

The liver

The liver is the largest internal organ. It lies under your right ribs just beneath your right lung. It has two lobes (sections).



The liver is made up mainly of cells called **hepatocytes**. It also has other types of cells, including cells that line its blood vessels and cells that line small tubes in the liver called **bile ducts**. The bile ducts carry bile from the liver to the gallbladder or directly to the intestines.

You cannot live without your liver. It has many important functions:

- It breaks down and stores many of the nutrients absorbed from the intestine that your body needs to function. Some nutrients must be changed (metabolized) in the liver before they can be used for energy or to build and repair body tissues.
- It makes most of the clotting factors that keep you from bleeding too much when you are cut or injured.
- It delivers bile into the intestines to help absorb nutrients (especially fats).
- It breaks down alcohol, drugs, and toxic wastes in the blood, which then pass from

the body through urine and stool

The different types of cells in the liver can form several types of malignant (cancerous) and benign (non-cancerous) tumors. These tumors have different causes, are treated differently, and have a different prognosis (outlook).

Primary liver cancer

A cancer that **starts** in the liver is called **primary** liver cancer. There is more than one kind of primary liver cancer.

Hepatocellular carcinoma (HCC)

This is the most common form of liver cancer in adults.

Hepatocellular cancers can have different growth patterns:

- Some begin as a single tumor that grows larger. Only late in the disease does it spread to other parts of the liver.
- A second type seems to start as many small cancer nodules throughout the liver, not just a single tumor. This is seen most often in people with cirrhosis (chronic liver damage) and is the most common pattern seen in the United States.

Doctors can classify several subtypes of HCC. Most often these subtypes do not affect treatment or prognosis (outlook). But one of these subtypes, **fibrolamellar**, is important to recognize. It is rare, making up less than 1% of HCCs and is most often seen in women younger than age 35. Often the rest of the liver is not diseased. This subtype tends to have a better outlook than other forms of HCC.

Most of the rest of this content refers only to hepatocellular carcinoma and is called liver cancer.

Intrahepatic cholangiocarcinoma (bile duct cancer)

About 10% to 20% of cancers that start in the liver are intrahepatic cholangiocarcinomas. These cancers start in the cells that line the small bile ducts (tubes that carry bile to the gallbladder) within the liver. Most cholangiocarcinomas, however, actually start in the bile ducts outside the liver.

Although the rest of this information is mainly about hepatocellular cancers, cholangiocarcinomas are often treated the same way. For more detailed information on this type of cancer, see [Bile Duct Cancer](#)².

Angiosarcoma and hemangiosarcoma

These are rare cancers that begin in cells lining the blood vessels of the liver. People who have been exposed to vinyl chloride or to thorium dioxide (Thorotrast) are more likely to develop these cancers (see [Liver cancer risk factors](#)).³ Some other cases are thought to be caused by exposure to arsenic or radium, or to an inherited condition known as **hereditary hemochromatosis**. In about half of all cases, no likely cause can be identified.

These tumors grow quickly and are usually too widespread to be removed surgically by the time they are found. Chemotherapy and radiation therapy may help slow the disease, but these cancers are usually very hard to treat. These cancers are treated like other sarcomas. For more information, see [Soft Tissue Sarcoma](#)⁴.

Hepatoblastoma

This is a very rare kind of cancer that develops in children, usually in those younger than 4 years old. The cells of hepatoblastoma are similar to fetal liver cells. About 2 out of 3 children with these tumors are treated successfully with surgery and chemotherapy, although the tumors are harder to treat if they have spread outside the liver.

Secondary liver cancer (metastatic liver cancer)

Most of the time when cancer is found in the liver it did not start there but has spread (metastasized) from somewhere else in the body, such as the pancreas, colon, stomach, breast, or lung. Because this cancer has spread from its original (primary) site, it is called a **secondary** liver cancer. These tumors are named and treated based on their primary site (where they started). For example, cancer that started in the lung and spread to the liver is called **lung cancer with spread to the liver**, not liver cancer. It is also treated as lung cancer.

In the United States and Europe, secondary (metastatic) liver tumors are more common than primary liver cancer. The opposite is true for many areas of Asia and Africa.

For more information on liver metastases from different types of cancer, see specific cancer types, as well as [Advanced Cancer](#).⁵

Benign liver tumors

Benign tumors sometimes grow large enough to cause problems, but they do not grow into nearby tissues or spread to distant parts of the body. If they need to be treated, the patient can usually be cured with surgery.

Hemangioma

The most common type of benign liver tumor, hemangiomas, start in blood vessels. Most hemangiomas of the liver cause no symptoms and do not need treatment. But some may bleed and need to be removed with surgery.

Hepatic adenoma

Hepatic adenoma is a benign tumor that starts from hepatocytes (the main type of liver cell). Most cause no symptoms and do not need treatment. But some eventually cause symptoms, such as pain or a lump in the abdomen (stomach area) or blood loss. Because there is a risk that the tumor could rupture (leading to severe blood loss) and a small risk that it could eventually develop into liver cancer, most experts will usually advise surgery to remove the tumor if possible.

Using certain drugs may increase the risk of getting these tumors. Women have a higher chance of having one of these tumors if they take birth control pills, although this is rare. Men who use anabolic steroids may also develop these tumors. Adenomas may shrink when these drugs are stopped.

Focal nodular hyperplasia

Focal nodular hyperplasia (FNH) is a tumor-like growth made up of several cell types (hepatocytes, bile duct cells, and connective tissue cells). Although FNH tumors are benign, they might cause symptoms. It can be hard to tell them apart from true liver cancers and doctors sometimes remove them when the diagnosis is unclear.

Both hepatic adenomas and FNH tumors are more common in women than in men.

Hyperlinks

1. www.cancer.org/cancer/cancer-basics/what-is-cancer.html
2. www.cancer.org/cancer/bile-duct-cancer.html
3. www.cancer.org/cancer/liver-cancer/causes-risks-prevention/risk-factors.html

4. www.cancer.org/cancer/soft-tissue-sarcoma.html
5. www.cancer.org/treatment/understanding-your-diagnosis/advanced-cancer.html

References

Abou-Alfa GK, Jarnigan W, Dika IE, D'Angelica M, Lowery M, Brown K, et al. Ch. 77 - Liver and Bile Duct Cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020:1314–1341.

National Cancer Institute. Physician Data Query (PDQ). Adult Primary Liver Cancer Treatment. Accessed at <https://www.cancer.gov/types/liver/hp/adult-liver-treatment-pdq> on March 13, 2019.

National Cancer Institute. Physician Data Query (PDQ). Childhood Liver Cancer Symptoms, Tests, Prognosis, and Stages – Patient Version. Accessed at https://www.cancer.gov/types/liver/patient/about-child-liver-cancer-pdq#_1. on March 12, 2019.

Suriawinata A. Pathology of malignant tumors. UpToDate website. <https://www.uptodate.com/contents/pathology-of-malignant-liver-tumors>. Updated August 21, 2017. Accessed March 12, 2019.

Schwartz JM and Kruskal JB. Solid liver lesions: Differential diagnosis and evaluation. UpToDate website. <https://www.uptodate.com/contents/solid-liver-lesions-differential-diagnosis-and-evaluation>. Updated March 14, 2018. Accessed March 12, 2019.

Last Medical Review: April 1, 2019 Last Revised: April 1, 2019

Key Statistics About Liver Cancer

The American Cancer Society's estimates for primary liver cancer and intrahepatic bile duct cancer in the United States for 2020 are:

- About 42,810 new cases (30,170 in men and 12,640 in women) will be diagnosed

- About 30,160 people (20,020 men and 10,140 women) will die of these cancers

Liver cancer incidence rates have more than tripled since 1980, while the death rates have more than doubled during this time.

Where is liver cancer more common?

Liver cancer is much more common in countries in sub-Saharan Africa and Southeast Asia than in the US. In many of these countries it is the most common type of cancer. More than 800,000 people are diagnosed with this cancer each year throughout the world. Liver cancer is also a leading cause of cancer deaths worldwide, accounting for more than 700,000 deaths each year.

Visit the [American Cancer Society's Cancer Statistics Center](#)¹ for more key statistics.

Hyperlinks

1. cancerstatisticscenter.cancer.org/

References

American Cancer Society. *Facts & Figures 2020*. American Cancer Society. Atlanta, Ga. 2020.

American Cancer Society. *Global Cancer Facts & Figures 4th edition*. Atlanta, Ga: American Cancer Society; 2018.

Last Medical Review: April 1, 2019 Last Revised: December 8, 2020

What's New in Liver Cancer Research?

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, as well as ways to improve treatments.

Prevention

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](#)¹. Ones being studied include DCP, Glypican-3, osteopontin and Golgi protein-73. CT scans and MRI scans are also being studied as different [imaging tests](#)² to screen for liver cancer instead of ultrasound.

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](#)³ or [chemoembolization](#)⁴ after surgery have not shown that they help people live longer. Research studies are also looking into newer drugs, like targeted therapy and may prove to be more effective. Some promising results have also been seen with [radioembolization](#)⁵, but these need to be confirmed in larger studies. Another area studied has been the use of anti-viral therapy in people with liver cancer related to having viral hepatitis to see if it improves outcomes after surgery.

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.

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](#)⁶ 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 are studying ways to predict if the cancer will come back by testing the liver cells in the surgery sample through genetic profiling. These studies are promising but will need to be confirmed in other larger studies before it is widely used.

Ablation therapy

Newer [ablation](#)⁷ techniques are being studied. One type, called irreversible electroporation, is an ablation procedure that does not use heat or cold to destroy cancer cells. It uses high voltage to open the "pores" of the cell (like the pores of your skin) which causes the cancer cells to die. It may be very useful for cancers that are in difficult areas to treat, such as near blood vessels.

Targeted therapy

New drugs have been developed that work differently from standard chemotherapy drugs. These new [targeted drugs](#)⁸ act on specific proteins in cancer cells or their surrounding environments.

Tumor blood vessels are the target of several newer drugs. Liver tumors need new blood vessels to grow. 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.

Ramucirumab (Cyramza) is another targeted drug that works on blocking new blood vessel growth which can result in tumor shrinkage. It is already being used in other cancers such as stomach cancer, NSCLC and colorectal cancer. It is being studied in people with liver cancer with positive results.

Biomarkers

Knowing which liver cancers will respond to certain treatments before giving them would help save people from side effects of unhelpful drugs. Research is being done to look for specific biomarkers (proteins) such as p-ERK, or genomic profiling (specific gene changes of a cancer) to see if targeted therapy or immunotherapy can be chosen based on a tumor's special traits.

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.

Hyperlinks

1. www.cancer.org/cancer/liver-cancer/detection-diagnosis-staging/detection.html
2. www.cancer.org/treatment/understanding-your-diagnosis/tests/imaging-radiology-tests-for-cancer.html
3. www.cancer.org/cancer/liver-cancer/treating/chemotherapy.html
4. www.cancer.org/cancer/liver-cancer/treating/embolization-therapy.html
5. www.cancer.org/cancer/liver-cancer/treating/embolization-therapy.html
6. www.cancer.org/treatment/survivorship-during-and-after-treatment/understanding-recurrence.html
7. www.cancer.org/cancer/liver-cancer/treating/tumor-ablation.html
8. www.cancer.org/cancer/liver-cancer/treating/targeted-therapy.html

References

Abou-Alfa GK, Jarnigan W, Dika IE, D'Angelica M, Lowery M, Brown K, et al. Ch. 77 - Liver and Bile Duct Cancer. In: Niederhuber JE, Armitage JO, Doroshow JH, Kastan MB, Tepper JE, eds. *Abeloff's Clinical Oncology*. 6th ed. Philadelphia, Pa: Elsevier; 2020:1314–1341.

Brawley OW and Parnes HL. Ch. 37 - Cancer Screening. In: DeVita VT, Lawrence TS, Rosenberg SA, eds. DeVita, Hellman, and Rosenberg's *Cancer: Principles and Practice of Oncology*. 11th ed. Philadelphia, Pa: Lippincott Williams & Wilkins; 2019:-454-470.

Colombo M and Sirlin CB. Surveillance for hepatocellular carcinoma in adults. UpToDate website. <https://www.uptodate.com/contents/surveillance-for-hepatocellular-carcinoma-in-adults>. Updated September 17, 2018. Accessed March 12, 2019.

Heo J, Reid T, Ruo L, et al. Randomized dose-finding clinical trial of oncolytic immunotherapeutic vaccinia JX-594 in liver cancer. *Nat Med*. 2013 Mar;19(3):329-336. Epub 2013 Feb 10.

Hoshida Y, Villanueva A, Kobayashi M, et al. Gene expression in fixed tissues and outcome in hepatocellular carcinoma. *N Engl J Med*. 2008;359:1995–2004.

Kudo M. Targeted and immune therapies for hepatocellular carcinoma: Predictions for 2019 and beyond. *World J Gastroenterol*. 2019;25(7):789-807.

National Cancer Institute. Physician Data Query (PDQ). Adult Primary Liver Cancer Treatment. Accessed at <https://www.cancer.gov/types/liver/hp/adult-liver-treatment-pdq> on March 13, 2019.

Ocker M. Biomarkers for hepatocellular carcinoma: What's new on the horizon?. *World J Gastroenterol*. 2018;24(35):3974-3979.

Rauol JL, Kudo M, Edeline J, Galle PR. Systemic therapy for intermediate and advanced hepatocellular carcinoma: Sorafenib and beyond. *Cancer Treat Rev*. 2018 Jul;68:16-24. doi: 10.1016/j.ctrv.2018.05.006. Epub 2018 May 26.

Salati U, Barry A, Chou FY, Ma R, Liu DM. State of the ablation nation: a review of ablative therapies for cure in the treatment of hepatocellular carcinoma. *Future Oncol*. 2017 Jul;13(16):1437-1448. doi: 10.2217/fon-2017-0061. Epub 2017 Jul 7.

Tenneti P, Borad MJ, Babiker HM. Exploring the role of oncolytic viruses in hepatobiliary cancers. *Immunotherapy*. 2018 Aug;10(11):971-986. doi: 10.2217/imt-2018-0048. Epub 2018 Jun 14.

Tsuchiya N, Sawada Y, Endo I, Saito K, Uemura Y, Nakatsura T. Biomarkers for the early diagnosis of hepatocellular carcinoma. *World J Gastroenterol*. 2015;21(37):10573-83.

Yin J, Li N, Han Y, et al. Effect of antiviral treatment with nucleotide/nucleoside analogs on postoperative prognosis of hepatitis B virus-related hepatocellular carcinoma: a two-stage longitudinal clinical study. *J Clin Oncol*. 2013 Oct 10;31(29):3647-3655. Epub 2013 Sep 3.

Zhang CH, Xu GL, Jia WD, Ge YS. Effects of interferon alpha treatment on recurrence and survival after complete resection or ablation of hepatocellular carcinoma: A meta-analysis of randomized controlled trials. *Int J Cancer*. 2009;124:2982–2988.

Zhong C, Guo RP, Li JQ, et al. A randomized controlled trial of hepatectomy with adjuvant transcatheter arterial chemoembolization versus hepatectomy alone for Stage IIIA hepatocellular carcinoma. *J Cancer Res Clin Oncol*. 2009;135:1437–1445.

Zhu AX, Kang YK, Yen CJ, Finn RS, Galle PR, Llovet JM, et al. Ramucirumab after sorafenib in patients with advanced hepatocellular carcinoma and increased -fetoprotein concentrations (REACH-2): a randomised, double-blind, placebo-controlled, phase 3 trial. *Lancet Oncol*. 2019 Feb;20(2):282-296.

Last Medical Review: April 1, 2019 Last Revised: April 1, 2019

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.

American Cancer Society medical information is copyrighted material. For reprint requests, please see our Content Usage Policy (www.cancer.org/about-us/policies/content-usage.html).

cancer.org | 1.800.227.2345