

Liver Cancer and Tumours

What causes liver cancer?

Many factors may play a role in the development of cancer. Because the liver filters blood from all parts of the body, cancer cells from elsewhere can lodge in the liver and start to grow. Cancers that begin in the gut often spread to the liver. The ability of the liver to regenerate may also be linked to the development of liver cancers.

How are liver cancers classified?

There are many types of liver tumours, only some of which are cancers. The most important classification is whether the tumours are benign (relatively harmless) or malignant (cancer, i.e., capable of spreading from the liver and thus more serious).

Benign Tumours

Hemangioma is the most common type of benign liver tumour. It is an abnormal growth of blood vessels of the liver that begins in the fetus. More than 10% of the normal population has hemangiomas in the liver. Most people with hemangiomas have no symptoms and require no treatment. Some hemangiomas may rarely enlarge and some may bleed in which case they may require surgical removal.

Hepatic adenomas are benign tumours of liver cells. Most do not cause symptoms and do not require treatment. Some however, have the potential to become cancers. Often doctors will suggest a biopsy to assess the potential for cancer development. If they are large, they may cause pain or blood loss and may need to be removed. Hepatic adenomas occur more frequently in women and seem to be triggered in some cases by the birth control pill or by pregnancy.

Focal nodular hyperplasia (FNH) is a tumour-like growth of several cell types. Although FNH tumours are benign, it can be hard to distinguish them from liver cancers.

Malignant Tumours

The most common form of primary liver cancer (cancer that starts in the liver) in adults is called *hepatocellular carcinoma (HCC)*. It is a cancer of liver cells. This type of cancer can have different growth patterns. Some begin as a single tumour that grows larger. It may spread to other parts of the liver in later stages of the disease.

Liver cancer may also develop in more than one site in the liver and may grow into multiple tumours. This pattern is most often seen in people with liver cirrhosis (scarring).

Another liver cancer is called *cholangiocarcinoma*. It originates in the small bile ducts which are tubes that carry bile to the gall bladder.



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In children the most common liver cancer is called *hepatoblastoma*. Hepatoblastomas are usually diagnosed within the first 3 years of life, and rarely beyond the age of five. It is also reported to occur more frequently in males than in females. This cancer is caused by rapid growth of immature or abnormal cells that no longer have the specialized function of normal liver cells.

Most often, however, when cancer occurs in the liver, it did not start there, but spread to the liver from a cancer that began somewhere else in the body. These types of cancers are named after the place where they began (primary site) and are considered *secondary liver cancers* or *cancer metastases*. For example, cancer that started in the lung and spread to the liver is called metastatic lung cancer with spread to the liver. Secondary liver cancers are 30 times more prevalent than primary liver cancers.

What are the risk factors associated with liver cancer?

In the absence of chronic liver disease liver cancer is rare. However, in patients with underlying liver disease, liver cancer may be quite common. The exact cause of liver cancer is not known but scientists have identified many risk factors that can make someone more likely to develop liver cancer:

- Among those with **chronic liver disease**, men are more likely to develop liver cancer than are women. The reason for this is unknown.
- **Viral infection of the liver:** Chronic infection with either hepatitis B or hepatitis C may lead to the development of cancer.
- Certain types of **inherited liver disease** such as hemochromatosis, which results in accumulation of too much iron in the liver, as well as alpha-1 antitrypsin deficiency, and tyrosinemia can lead to the development of liver cancer later in life.
- **Cirrhosis** is the formation of scar tissue in the liver. This can often lead to cancer. Major causes of liver cirrhosis are alcohol use, chronic hepatitis B and C, and non-alcoholic steatohepatitis (NASH). Most causes of cirrhosis are also associated with the development of liver cancer.
- **Alcohol:** excessive alcohol use is a known risk factor for development of alcoholic cirrhosis and liver cancer.
- **Obesity** increases the risk of liver cancer in those patients in whom it causes liver disease.
- **Tobacco** use increases the risk of liver cancer if you already have chronic liver disease.
- **Anabolic steroids:** long-term use of anabolic steroids can increase the risk of liver cancer.



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What is the incidence of primary liver cancers?

Primary liver cancers account for less than 1% of all cancers in North America whereas in Africa, Southeast Asia, and China, they may account for up to 50% of cancers. The high prevalence of people carrying the hepatitis B virus and having liver cirrhosis may account for this geographic discrepancy. Worldwide primary liver cancers are the third most common cause of cancer death.

What are the symptoms of liver cancer?

In the early stages, liver cancer does not cause symptoms. Some common symptoms of advanced liver cancer include:

- weight loss
- loss of appetite
- abdominal pain
- jaundice
- fluid in the abdomen

How is liver cancer detected?

- ultrasound
- blood test to check for increased levels of alpha-fetoprotein (AFP)
- computer tomography scan (CT)
- magnetic resonance imaging (MRI)

Are there treatments for liver cancer?

The treatment of HCC depends on the stage and the speed of tumour growth. Small primary cancers of the liver are curable. Cure rates generally decrease as the tumour size increases. Treatment of liver cancer may involve surgery, radiation therapy and chemotherapy or liver transplantation.

Surgery

Surgery can remove a small liver tumour through a procedure known as resection, in which a piece of the liver containing the tumour is removed. If all of the cancer can be removed, a patient has a good outlook for survival. If the cancer is too large, is found in many different parts of the liver, or has spread beyond the liver, it may not be possible to remove it completely. For many people with cirrhosis there is insufficient healthy liver to allow removal of even a small part of the liver. In this case, surgery is not an option.



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Tumour ablation or embolization

Ablation refers to methods that destroy the tumour without removing it. Examples include destroying the tumour by using high-energy radio waves (RFA), freezing it with a very cold metal probe, or injecting alcohol directly into the tumour to kill cancer cells. The blood supply to the cancer can be reduced by blocking the artery that feeds the cancer or by injecting materials that plug the artery. This is called embolization. Because this kind of treatment also reduces blood supply to the normal liver tissue, it can be dangerous for people with diseases such as hepatitis or cirrhosis.

Chemoembolization

Chemoembolization involves combining embolization with chemotherapy. Chemoembolization prolongs life in patients in whom cure is not possible.

Radiation therapy

Radiation therapy is treatment that uses high-energy rays (such as x-rays) to kill or shrink cancer cells. This type of treatment may be used to shrink a liver tumour or to provide relief from symptoms, but it does not cure the liver cancer. Studies to show that radiation therapy prolongs life have not yet been done.

Chemotherapy

Chemotherapy refers to the use of drugs to kill cancer cells. Usually the drugs are given into a vein or by mouth. Liver cancer does not respond well to most chemotherapy drugs.

Are people with liver cancer considered for transplantation?

Most cancers of the liver begin elsewhere in the body and are spread to the liver. These cancers are not curable through liver transplantation. Tumours that originate in the liver are usually detected in an advanced stage. They are also rarely cured by a liver transplant. If the cancer is small and confined to the liver, a transplant may be considered.

Are there treatments for secondary liver cancers?

The liver is involved in approximately one third of all cancers and often those that begin in the gastrointestinal tract, colon, pancreas, stomach, breast and lung. The risk factors involved in this type of liver cancer are numerous given that the cancers originate elsewhere. The prognosis for patients with secondary liver tumors depends on the primary site of malignancy. In general, patients do not live longer than one year from the diagnosis of hepatic metastases. Treatments remain unsatisfactory but include surgery, chemotherapy, immunotherapy, and embolization.



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Can liver cancer be prevented?

Prevention is the best defence against liver cancer. Worldwide, the most common risk factors for liver cancer are chronic hepatitis B and C infections. Therefore, prevention of these forms of liver disease is important. The Canadian Liver Foundation recommends that all children as well as adults at high risk should be vaccinated against hepatitis B.

Since there is no vaccine against hepatitis C, it is important to prevent the spread of this disease, and to identify and assess for treatment all those who are already infected with the hepatitis C virus. The Canadian Liver Foundation recommends that adults born between 1945 and 1975 should be screened for hepatitis C.

Alcohol consumption should be limited to no more than one to two standard drinks per day. Drinking alcohol every day as well as binge drinking can be harmful to your liver. If you already have a liver disease, the safest amount of alcohol is no alcohol at all.

It is important to maintain a well balanced diet and introduce exercise into your daily routine.

People at high risk of liver cancer should be screened regularly to increase the chances of early detection. Early detection of small liver cancers greatly enhances the chances of cure using techniques such as radiofrequency ablation. Everyone who is at risk for the development of primary liver cancer should undergo regular screening by ultrasonography at six monthly intervals. Finding of abnormal screening ultrasound results should prompt a visit to a liver specialist.

What does the future hold?

The Canadian Liver Foundation funds research into the causes, diagnosis, prevention and treatment of all forms of liver disease including liver cancer. Scientists are looking for the causes of liver cancer, ways to prevent it and to improve treatments. Control of viral hepatitis infection and better treatments for chronic hepatitis could prevent about half of liver cancer cases worldwide. New methods that combine treatments with surgery are being studied.

This information is current for September 2021.