NCCN GUIDELINES FOR PATIENTS®

2025

Liver Cancer

Presented with support from NCCN FOUNDATION® Guiding Treatment. Changing Lives.

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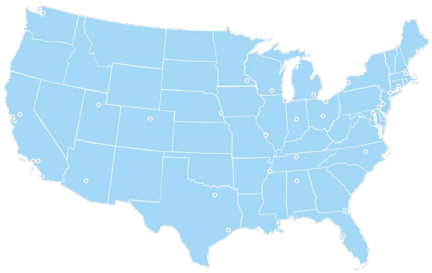
About the NCCN Guidelines for Patients®

National Comprehensive Cancer Network®



Did you know that top cancer centers across the United States work together to improve cancer care? This alliance of leading cancer centers is called the National Comprehensive Cancer Network® (NCCN®).

Cancer care is always changing. NCCN develops evidence-based cancer care recommendations used by health care providers worldwide. These frequently updated recommendations are the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®). The NCCN Guidelines for Patients plainly explain these expert recommendations for people with cancer and caregivers.

These NCCN Guidelines for Patients are based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Hepatocellular Carcinoma, Version 1.2025 – March 20, 2025.

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NCCN.org/patient-guidelines-process

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NCCN Foundation seeks to support the millions of patients and their families affected by a cancer diagnosis by funding and distributing NCCN Guidelines for Patients. NCCN Foundation is also committed to advancing cancer treatment by funding the nation's promising doctors at the center of innovation in cancer research. For more details and the full library of patient and caregiver resources, visit NCCN.org/patients.

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1
About liver cancer

You've been told you may have, or already have, liver cancer. This is a scary and stressful time. What is liver cancer? This chapter explains what liver cancer is and how it works.

What is liver cancer?

Liver cancer is a disease where cells in the liver multiply and grow out of control.

The liver is a large organ located on the right side of the body under the rib cage. The liver filters blood, helps with blood clotting, makes bile, breaks down fats, and helps process sugar for energy.

The liver also produces lymph. Lymph gives cells water and food, and contains white blood cells that fight germs.

Liver cancer occurs when something goes wrong with the natural cell process, causing some liver cells to become cancer cells.

Cancer cells don't behave like normal cells. Cancer cells develop genetic changes that allow them to multiply and make many more cancer cells. The cancer cells crowd out and overwhelm normal cells.

Cancer cells also survive much longer than normal cells do. They can replace many normal cells and cause organs to stop working properly. This can end up harming the body.

Why you should read this book

Making decisions about cancer care can be stressful. You may need to make tough decisions under pressure about complex choices.

The NCCN Guidelines for Patients are trusted by patients and providers. They clearly explain current care recommendations made by respected experts in the field. Recommendations are based on the latest research and practices at leading cancer centers.

Cancer care is not the same for everyone. By following expert recommendations for your situation, you are more likely to improve your care and have better outcomes as a result. Use this book as your guide to find the information you need to make important decisions.

If the liver stops working properly, then one symptom a person might notice is a yellowing of their skin and eyes, called jaundice. This is a direct result of a buildup of bilirubin in the body, which the liver normally filters out.

Cancer cells can also spread outside the liver and form tumors in other areas of the body. This is called metastatic liver cancer.

Is there more than one type of liver cancer?

Cancer that starts in the liver is called primary liver cancer. There is more than one type of primary liver cancer in adults:

Hepatocellular carcinoma

The most common type is hepatocellular carcinoma (HCC), which is cancer of the liver cells. HCC, or liver cancer, is the focus of this book.

Signs and symptoms of liver cancer include:

- Abdominal pain
- Abdominal swelling or mass
- Fatigue
- Fluid in the abdomen
- Jaundice (yellowing of the skin and eyes)
- Weight loss

There is a subtype of HCC called fibrolamellar hepatocellular carcinoma (FLHCC). FLHCC affects very few people and usually occurs at a younger age. The treatments are the same as for HCC, so this book applies to you if you're living with FLHCC.

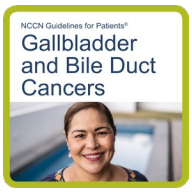
Intrahepatic cholangiocarcinoma

The second most common type of this cancer in adults is called intrahepatic cholangiocarcinoma, which is a cancer of the bile ducts. The signs and symptoms of intrahepatic cholangiocarcinoma are similar to liver cancer, but the location of the tumor is in the bile ducts, which are a spider web of small tubes inside the liver.

Cancer that starts in the liver is called primary liver cancer.

However, if someone has lung cancer that spreads to the liver, that's still considered lung cancer.

More information on gallbladder and bile duct tumors is available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.



Sometimes, another type of cancer spreads to the liver. This is called secondary cancer, or metastatic cancer. For example, cancer that starts in the intestines (colon) and spreads to the liver is called metastatic colon cancer to the liver. But it's still colon cancer, not liver cancer.

What causes liver cancer?

Cancer researchers don't know what causes liver cells to grow out of control (become cancerous). But several factors are linked to a higher risk of liver cancer. These are called risk factors. A risk factor is anything that increases your chance of getting cancer.

Risk factors don't necessarily cause liver cancer. You can have liver cancer without having any of the risk factors. But having one or more of these risk factors raises your chances of getting liver cancer:

- **Age** – Risk for liver cancer increases with age because liver damage can accumulate over time.
- **Alcohol use** – Heavy and long-term alcohol use can cause cirrhosis, which in turn is a risk factor for liver cancer.
- **Weight** – The higher a person's body mass index (BMI) and the larger their waist size, the more likely that person is to get liver cancer.

Guide 1
Risk factors for developing liver cancer

- Family history of liver cancer
- Too much iron in the body (hemochromatosis)
- Obesity
- Hepatitis B virus or infection
- Men born in Asia, aged 40 years and over
- Women born in Asia, aged 50 years and over
- Any adult born in an African nation

For people with cirrhosis, these additional risk factors apply:

- Hepatitis C virus or infection
- Alcohol use
- Non-alcoholic steatohepatitis (NASH), also known as non-alcoholic fatty liver disease (NAFLD)

- **Genetics** – Some cancers run in families. Tell your care team if your family has a history of liver cancer.
- **Hepatitis** – Having hepatitis B or C virus increases your risk of liver cancer.

Guide 1 shows more specific risk factors. Cirrhosis, which is scarring of the liver from repeated damage, sometimes from alcohol use, is mentioned as one particular risk factor.

How is liver cancer treated?

Although there's no cure for liver cancer, several treatments can reduce symptoms and help you live longer.

However, before treatment can begin, you'll have numerous tests to diagnose your particular type of cancer. See *Chapter 2: Testing for liver cancer*.

The most common treatments for most cases of liver cancer are surgery, liver transplant, and regional therapy, such as radiation therapy. For more about these and other treatments, see *Chapter 3: Types of treatment*.

Liver cancer that spreads to different areas of the body needs more intensive treatment. See *Chapter 6: Metastatic liver cancer.*

What can you do to get the best care?

Advocate for yourself. You have an important role to play in your care. In fact, you're more likely to get the care you want by asking questions and making shared decisions with your care team.

The NCCN Guidelines for Patients will help you understand cancer care. With better understanding, you'll be more prepared to discuss your care with your team and share your concerns. Many people feel more satisfied when they play an active role in their care.

You may not know what to ask your care team. That's common. Each chapter in this book ends with an important section called *Questions to ask*. These suggested questions will help you get more information on all aspects of your care.

Take the next step and keep reading to learn what is the best care for you!

2
Testing for liver cancer

Liver cancer is confirmed with imaging tests. Sometimes, a biopsy is needed as well. More tests are then done to plan treatment. This chapter presents an overview of the tests you might receive and what to expect.

You'll first receive imaging scans to confirm the diagnosis of liver cancer. When liver cancer is found, you'll receive the tests to plan treatment listed in **Guide 2**.

Keep these things in mind:

- Choose a friend, family member, or peer who can drive you to appointments, provide meals, or offer emotional support during diagnosis and treatment.
- Bring someone with you to care team visits, if possible.
- Write down questions and take notes during appointments. Don't be afraid to ask your care team questions. Get to know your care team and help them get to know you.
- Get copies of blood tests, imaging results, and reports about the specific type of cancer you have.
- Organize your papers. Create files for insurance forms, medical records, and test results. You can do the same on your computer.
- Keep a list of contact information for everyone on your care team. Add it to your phone. Hang the list on your refrigerator or keep it in a place where someone can access it in an emergency. Keep your primary care physician informed of changes to this list. They're great partners in your care.
- In your contact list, include information on your exact type of cancer, as well as any treatments and the date each treatment started.

Guide 2
Tests for treatment planning

Medical history and physical exam
Hepatitis panel
Bilirubin, transaminases, alkaline phosphatase
Prothrombin time or international normalized ratio, albumin, blood urea nitrogen, and creatinine
Complete blood count (CBC) and platelet count
Alpha-fetoprotein (AFP)
Chest CT
Bone scan, if needed
Abdominal and pelvic CT or MRI with contrast, if not done before or needs to be updated

Imaging tests

Imaging tests take pictures of the inside of your body. After you have imaging, a radiologist, an expert in interpreting imaging tests, will write a report and send it to your health care provider.

The report may be sent to you through your patient portal or access system.

You should discuss these results with your care team.

Contrast material

Contrast material is used to improve imaging pictures. Contrast materials are not dyes. They're substances that help enhance and improve the images of organs and structures in the body.

The contrast isn't permanent and will leave the body in your pee immediately after the test.

The types of contrast vary and are different for CT and MRI.

Contrast might not be used if you have a serious allergy or if your kidneys aren't working well. Tell your care team if you've had allergic reactions to contrast in the past. You might be given medicine to avoid the effects of allergies.

CT scan

A CT scan uses x-rays and computer technology to take pictures of the inside of the body. It takes many x-rays of the same body part from different angles. All the images are combined to make a series of detailed cross-sectional images of the body.

A CT scan of your chest, abdomen, and/or pelvis may be needed to check for liver cancer. In most cases, contrast will be used.

Some people refer to this test as a CAT scan. Either name is correct.

CT machine

A CT machine is large and has a tunnel in the middle. During the test, you will lie on the table that moves slowly through the tunnel.

Multiphasic CT scan

A multiphasic CT scan starts without contrast. Then contrast is added, and multiple sets of pictures are taken as the contrast moves through the arteries and veins of the liver.

This allows your care team to see where the tumor is in the liver and if the tumor involves any veins, arteries, or other organs.

MRI scan

An MRI scan uses radio waves and powerful magnets to take pictures of the inside of the body. It doesn't use x-rays or radiation and is painless.

Because the MRI machine uses very strong magnets, tell the technologist if you have any metal in your body. You'll probably need to undress completely and wear a robe in the scanning room.

During the test, you'll likely be asked to hold your breath for 10 to 20 seconds as the technician collects the images. Contrast is often used. When a scan is taken with and without contrast, that's called a "dynamic" MRI.

The most common type of MRI machine, a closed MRI, has a capsule-like design where the magnet surrounds you. There are open MRIs, which have a magnetic top and bottom and an opening on each end.

Closed MRIs are more common than open MRIs, so if you're afraid of enclosed or tight spaces (claustrophobia), be sure to talk to your care team about it. A mild relaxant/sedative can given for some patients with claustrophobia to help tolerate the MRI scan.

MRIs are also loud. Ask the scanning team for earplugs or headphones to help with the noise. Sometimes they might play music inside the machine as well. You can also ask for a blanket or cushions to make yourself more comfortable during the scan.

The MRI technicians can talk to you through an intercom inside the machine. You'll also have a way to signal to the scanning team that you need help with a button.

PET scan

A PET scan uses a radioactive substance called a tracer. The tracer is injected into a vein to show where cancer spots might be in the body. It harmlessly comes out of the body in your pee within 24 hours.

The tracer causes cancer to show up as bright spots on PET scans. However, not all tumors will appear on a PET scan, and not all bright spots are cancer. It's typical for the brain, heart, kidneys, and bladder to be bright on the PET scan.

Inflammation or infection can also show up as a bright spot.

When a PET scan is combined with CT, it's called a PET/CT scan.

Bone scan

Liver cancer can spread to the bones. A bone scan uses a PET scan in combination with a CT scan.

Areas of bone damage will show up as bright spots in the pictures. Bone damage can be caused by cancer, cancer treatment, previous injuries, or other health issues.

Ultrasound

An ultrasound uses high-energy sound waves to form pictures of the inside of the body. It's like a sonogram used during pregnancy. A wand-like probe (transducer) is moved on your skin. A gel is applied to your skin beforehand to help the probe move more easily.

Ultrasound is painless and does not use radiation like x-rays, so it can be repeated as needed. It's also good at showing small areas of cancer that are near the skin. Sometimes, an ultrasound is used to guide a biopsy.

General health tests

Medical history

A medical history, sometimes called a health history, will help determine which treatment is best for you.

A medical history is a record of all health issues and treatments you've had in your life. Be prepared to list any illness or injury, and when it happened. Also, tell your care team about any symptoms you have.

Bring a list of your old and new medicines and any over-the-counter (OTC) medicines, herbal remedies, or supplements you take. Some supplements can affect medicines that your care team may prescribe.

Family history

Some cancers and other diseases can run in families. Your health care provider will ask about the health history of family members who are blood relatives. This information is called a family history.

Ask family members on both sides of your family about their health issues like heart disease, cancer, and diabetes, and at what age they were diagnosed.

You should find out the specific type of cancer or where the cancer started, if it's in multiple locations, and if they had genetic testing.

Physical exam

A member of your care team will perform a thorough physical exam of your body. This exam includes checking vital signs such as heart rate and blood pressure. Your provider may also gently press on areas of your body, feeling for swollen organs or lymph nodes.

Blood tests

Blood tests check for signs of disease and how well organs are working. They require a sample of your blood, which is removed through a needle placed into your vein.

If you know your veins are difficult to find, let the lab tech know, and they may be able to get a machine that will help find your veins. This way, you'll get fewer pokes from the needle, and it's less stressful.

Complete blood count

A complete blood count (CBC) measures the levels of red blood cells, white blood cells, and platelets in your blood. Red blood cells carry oxygen throughout your body, white blood cells fight infection, and platelets control bleeding.

Elevated white blood cells, as well as a reduction in red blood cells or platelets, can indicate infection or cancer.

Comprehensive metabolic panel

A comprehensive metabolic panel measures 14 different substances in your blood, including blood urea nitrogen and creatinine. This test provides important information about how well your kidneys and liver are working.

Liver function panel

Liver function tests look at the health of your liver by measuring chemicals that are made or processed by the liver. Levels that are too high or too low signal that the liver isn't working well.

A liver function panel usually measures:

- Albumin
- Alkaline phosphatase
- Alpha-fetoprotein
- Aspartate aminotransferase and alanine transaminase
- Bilirubin

The liver produces chemicals necessary for your blood to clot in response to an injury. Tests to measure how long it takes your blood to clot might be done, such as:

- International normalized ratio
- Prothrombin time

Some of these measurements are used to determine your Child-Turcotte-Pugh class.

Child-Turcotte-Pugh class

The Child-Turcotte-Pugh score measures the severity of liver disease, such as cirrhosis or liver cancer. This score helps your treatment team see how well your liver is working and if surgery is recommended.

The score is based on signs, symptoms, and blood test results. Those with a Child-Turcotte-Pugh Class A have the lowest risk of complications or death from surgery. In some cases, those with Child-Turcotte-Pugh Class B might be recommended for surgery.

Those with Child-Turcotte-Pugh Class C won't be recommended for surgery as often, since they have the most severe disease of the three classes.

Hepatitis panel

A hepatitis panel is a blood test that checks to see if you have a hepatitis infection. You may be referred to a hepatologist if you test positive. A hepatologist is a health care provider who specializes in the care of the liver, biliary tract, gallbladder, and pancreas.

Hepatitis infection causes the liver to become swollen. When swollen, the liver might not work as it should. Viruses called hepatitis B and hepatitis C are the most common types of chronic (long-term) hepatitis.

Chronic hepatitis B and a current or past infection with hepatitis C increase the risk for liver cancer and biliary tract cancers. Hepatitis B can cause cirrhosis, liver failure, and cancer.

If you're at high risk for liver cancer, CT or MRI findings may be enough to make the diagnosis. So, a biopsy may not be needed.

Biopsy

A biopsy is a procedure that removes samples of fluid or tissue from your body. These samples are then used to diagnose cancer. These biopsy procedures are typically outpatient procedures, allowing most patients to go home the same day.

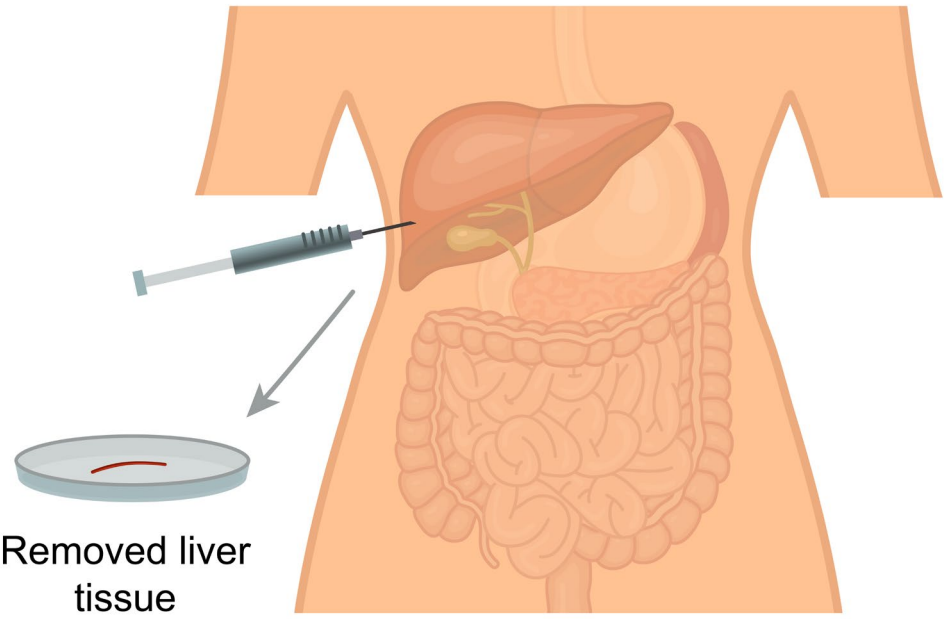
You will not be put to sleep completely, but may receive a mild sedative to put you at ease.

Types of biopsies include:

- **Fine-needle aspiration** uses a thin needle to remove a sample of tissue or fluid. An ultrasound may guide the biopsy.
- **Core needle biopsy** removes tissue samples with a hollow needle about the same size as a needle used for an IV line. An ultrasound or CT scan may help the radiologist find the area to biopsy.

The biopsy samples will be sent to a pathologist, an expert in examining cells under a microscope to find disease.

A biopsy is a procedure that removes samples of fluid or tissue from your body. These samples are then used to diagnose cancer.



The pathologist will test the sample to look for biomarkers or proteins. This information, called tumor biomarker testing, is used to choose the best treatment for you.

Tumor biomarker testing

Biomarkers are any chemical, substance, or other sign in your body that can be measured to assess your health. Cancer antigen 19-9 (CA 19-9), carcinoembryonic antigen, and alpha-fetoprotein (AFP) are examples of tumor biomarkers that can be detected in the blood.

These tumor biomarkers can help with diagnosis, seeing how well treatment works, and keeping track of cancer growth. They can also be used to determine appropriate targets for targeted therapy, described in the next chapter.

Tumor mutation testing

A sample of your tumor or blood from your biopsy may be tested to see if the cancer cells have any specific mutations. Some mutations, such as NTRK and RET gene fusions or microsatellite instability-high (MSI-H)/mismatch repair deficient (dMMR) mutations, can be targeted with specific therapies.

Tumor mutation testing is separate from genetic testing for mutations that you may have inherited from your biological parents. Currently, genetic testing isn't required for liver cancer treatment.

Performance status

Performance status is a measure of a person's general level of fitness and ability to perform daily tasks. The most common rating scale (the Eastern Cooperative Oncology Group Performance Status), assigns you a number between 0 and 4, with 0 being the highest level of functioning and 4 being the lowest.

Performance status is one factor taken into consideration when choosing a treatment plan. If you have a lower performance status, you might not receive certain treatments, such as surgeries, until your cancer improves with other treatments like medication. However, your preferences about treatment are also important.

Test results

Results from blood tests, imaging studies, and biopsies will be used to determine your treatment plan. Treatment will be based on these findings. For example, if your biopsy shows liver cancer and your performance status is very good, then you'll be prepared for surgery.

You need to understand what these tests and the results mean. Don't be afraid to ask your care team questions about them. Online patient portals are also a great way to access your test results.

What's next?

Once you've received your complete diagnosis and you've discussed the treatment plan with your care team, you'll begin treatment. The next chapter describes each NCCN-recommended treatment in detail.

Key points

- Tests are used to find cancer, plan treatment, and check how well treatment is working.
- A medical history and physical exam inform your care team about your overall health.
- Blood tests check for signs of disease and how well organs are working.
- Imaging tests take pictures of the inside of your body. Liver cancer is usually confirmed with imaging tests.
- Fibrosis score and Child-Turcotte-Pugh class are used to see how well the liver is working, help decide if surgery is an option, and plan treatment.
- A biopsy removes a sample of tissue or fluid.
- Performance status is a person's general level of fitness and ability to perform tasks.

Questions to ask

- What tests will I have? How often will they be repeated?
- Will my insurance pay for these tests?
- How soon will I know the results and who will explain them to me?
- What will you do to make me comfortable during testing?

Let us know what you think!

Please take a moment to complete an online survey about the NCCN Guidelines for Patients.
NCCN.org/patients/response

3
Types of treatment

There's more than one treatment for liver cancer. Sometimes, you'll have multiple treatments at different times. This chapter describes NCCN-recommended treatment options and what to expect.

Liver cancer is treatable. You should have regular talks with your care team about your goals for treatment and your treatment plan. If possible, seek treatment at a hospital or cancer center that specializes in liver cancer.

There are many treatment options for liver cancer. But there are 2 basic methods for treatment:

- **Local therapy** focuses treatment on a certain area of the body. It includes surgery, ablation, direct therapy, and radiation therapy.
- **Systemic drug therapy** works throughout the body. For liver cancer, this includes drug therapies such as targeted therapy and immunotherapy.

Treatment can be local, systemic, or a combination of both. Many factors play a role in how your cancer responds to treatment.

Care team

Treating liver cancer takes a team approach. Treatment decisions should involve a multidisciplinary team.

This is a team of health care and psychosocial care professionals from different professional backgrounds who have knowledge and experience in your type of cancer.

This team is united in the planning and implementation of your treatment. Ask who will coordinate your care.

Some members of your care team will be with you throughout cancer treatment, while others will only be there for parts of it. Get to know your care team and help them get to know you.

You know your body better than anyone. Help other team members understand:

- How you're feeling
- What you need
- What is working and what isn't

Keep a list of names and contact information for each member of your team. This will make it easier for you and anyone involved in your care to know whom to contact with questions or concerns.

Team approach

Depending on your diagnosis, your team might include the following specialists:

A hepatologist is an expert in diseases of the liver, gallbladder, bile ducts, and pancreas.

A diagnostic radiologist interprets the results of imaging tests.

An interventional radiologist performs needle biopsies, ablations, and direct therapies and places ports for treatment.

A pathologist analyzes the cells, tissues, and organs removed during a biopsy or surgery and provides cancer diagnosis, staging, and information about biomarker testing.

A surgical oncologist performs operations to remove cancer. Some transplant surgeons and hepatobiliary surgeons also care for those with liver cancer.

A medical oncologist treats cancer using drug therapies.

A radiation oncologist prescribes and delivers radiation therapy to treat cancer.

An anesthesiologist gives anesthesia, a medicine so you do not feel pain during surgery or procedures.

Surgery

Surgery is often the main treatment to remove cancer from the liver. It can also be used to ease pain or discomfort, called palliative surgery.

When preparing for surgery, seek the opinion of an experienced surgeon. Hospitals that perform many surgeries often have better results. You can ask for a referral to a hospital or cancer center that has experience in treating liver cancer.

Surgery is based on the safest and best way to remove cancer. The removal of the cancer through surgery can be accomplished in different ways depending on the specific circumstances. Tumors in hard-to-reach locations or particularly large tumors might not be removable by surgery.

You might have more than one surgery. You might also have a temporary wound drain to prevent fluid from collecting in the body after surgery.

Goal of surgery

The goal of surgery, or tumor resection, is to remove all the cancer. To do so, the tumor is removed along with a rim of normal-looking tissue around its edge called the surgical margin.

The surgical margin may look normal during surgery, but cancerous cells may be found when viewed under a microscope by a pathologist. This is called a positive margin. In a positive margin, cancer cells are found in normal-looking tissue around the tumor. Tests have shown that it's "positive for cancer." You

may need another surgery to try to remove the remaining tumor cells.

A clear or negative margin is when no cancer cells are found in the tissue around the edge of the tumor. Tests have shown that it's "negative for cancer."

Tumor removal

Surgically cutting out the tumor is called tumor removal, or tumor resection. Imaging tests will be ordered to see if your cancer can be removed by surgery (resectable) or cannot be removed (unresectable).

Partial liver removal

A partial liver removal (hepatectomy) is different than a liver transplant. It's removing a portion of the liver, perhaps a small piece or an entire lobe.

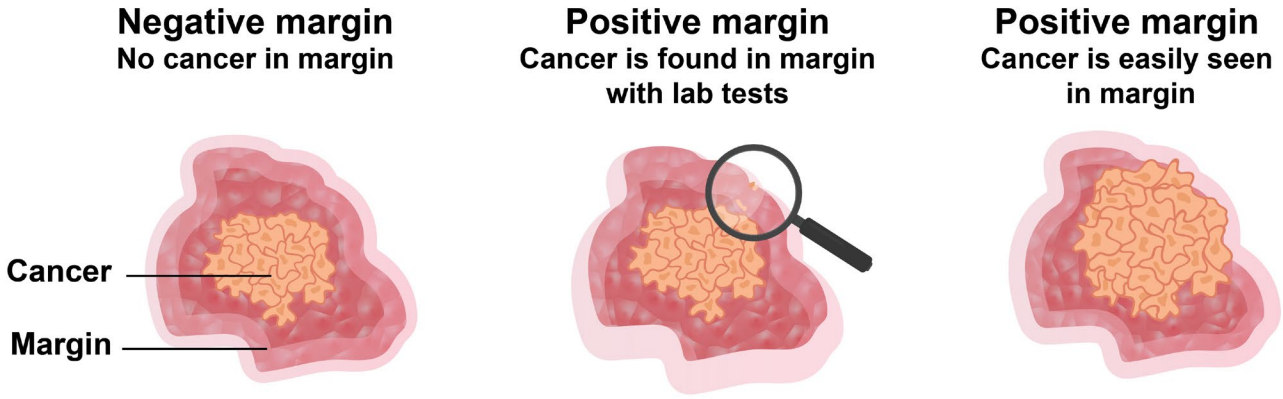
After surgery, the part of the liver that remains will keep working, and the missing section will regrow.

Liver transplant

In a liver transplant, the entire liver is removed and replaced with a healthy donor liver. The new liver may be donated by a person who recently died, or a section of the liver may be donated by a living person.

Surgical margin

The tumor will be removed, along with some normal-looking tissue around its rim. The normal-looking tissue is called the surgical margin. The surgical margin will be tested for cancer. Postoperative therapy is based on if there is cancer in the margins.



A liver transplant is based on certain size limits and tumor locations. If you receive a liver transplant, you'll also receive medicine to help prevent the donor liver from being rejected by your body.

If you can't have a partial liver transplant due to the number of tumors, you might receive a complete liver transplant. However, not everyone is a candidate for a liver transplant. There are specific requirements that need to be met to qualify.

UNOS transplant requirements

Requirements to qualify for a liver transplant are set by the United Network for Organ Sharing (UNOS), the non-profit organization that manages the organ transplant list in the United States.

UNOS requires you to have:

- An alpha-fetoprotein (AFP) level of 1,000 ng/mL or less
- A single tumor of 5 cm or less (the size of a lime), or 2 or 3 tumors each 3 cm or less (the size of a grape)
- A tumor that isn't located in a large vein, artery, or bile duct
- Cancer confined to the liver
- An adequate Model for End-Stage Liver Disease (MELD) score demonstrating the need for the liver

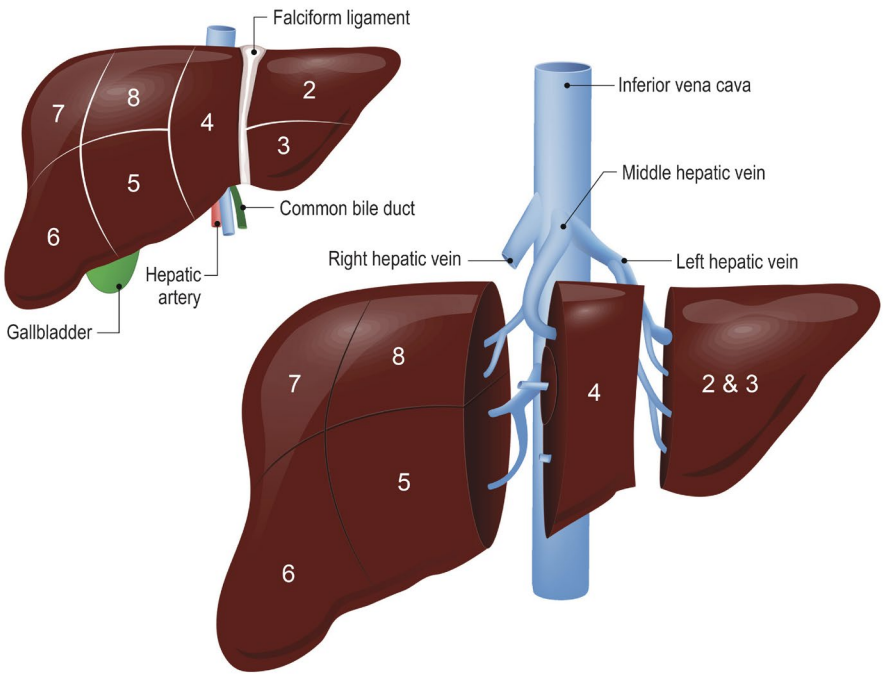
Exceptions to these requirements are sometimes made at select transplant centers.

MELD requirements

The poorer the liver function, the higher the MELD score. The person with the highest MELD score is at the top of the transplant list.

Liver sections

The liver is divided into 8 sections or segments based on the location of the portal vein, hepatic vein, and bile ducts.



A MELD score shows UNOS how much a person needs a transplant, based on 5 blood tests:

- Total bilirubin, a measure of jaundice
- Prothrombin time, a measure of clotting ability
- Creatinine, a measure of kidney function
- Serum sodium, a measure of how much sodium is in the bloodstream
- Albumin, a measure of liver and kidney function

You can calculate your MELD score using an online calculator and a copy of your latest blood test results. Your health care team will also do this for the transplant list.

Downstaging therapy

Downstaging therapy is used to reduce the amount of tumors (tumor burden) in some people with more advanced liver cancer (without distant metastasis) who can't receive a transplant currently, with the goal of getting a transplant in the future.

Bridge therapy

A liver transplant candidate can take a while to find a match, so they might receive treatment while they wait. These treatments are called bridge or bridging therapy and include ablation, arterially directed therapy (embolization), or radiation therapy.

Destroying cancer cells with ablation

Ablation (uh·BLAY·shun) is a type of treatment that uses extreme cold or heat, radio waves, microwaves, or chemicals such as ethanol (a type of alcohol) or acetic acid to destroy cancer cells.

A similar procedure you may have already had is freezing off a mole or wart, done by either your dermatologist or at home with an over-the-counter freezing solution. The principle is the same.

Ablation can destroy small tumors (3 cm, the size of a grape) with little harm to nearby tissue. Tumors must be in an area that can be reached by ablation and not near other major organs, blood vessels, or bile ducts.

Types of ablation include:

- **Chemical** – Uses ethanol or acetic acid injections to kill cancer cells.
- **Thermal** – Uses radiofrequency ablation or microwave ablation to kill cancer cells by heating them with high-energy radio waves or microwaves.
- **Cryoablation** – Freezes cancer cells with a very cold substance.

Ablation can be done through the skin, through small cuts (laparoscopic), or using a large incision like in surgery (open approach).

All types of ablation use a special needle, called a probe, which is inserted into the tumor. The probe is guided into place with a CT scan, ultrasound, or other type of imaging. The probe is removed afterward.

Your care team will check the tumor size and location, and how well your liver is working, before doing this treatment. Typically, people with smaller tumors (3 cm or smaller) or in a location that will be easy for the probe to reach (such as on the surface of the liver) are good candidates for this procedure.

Direct therapy

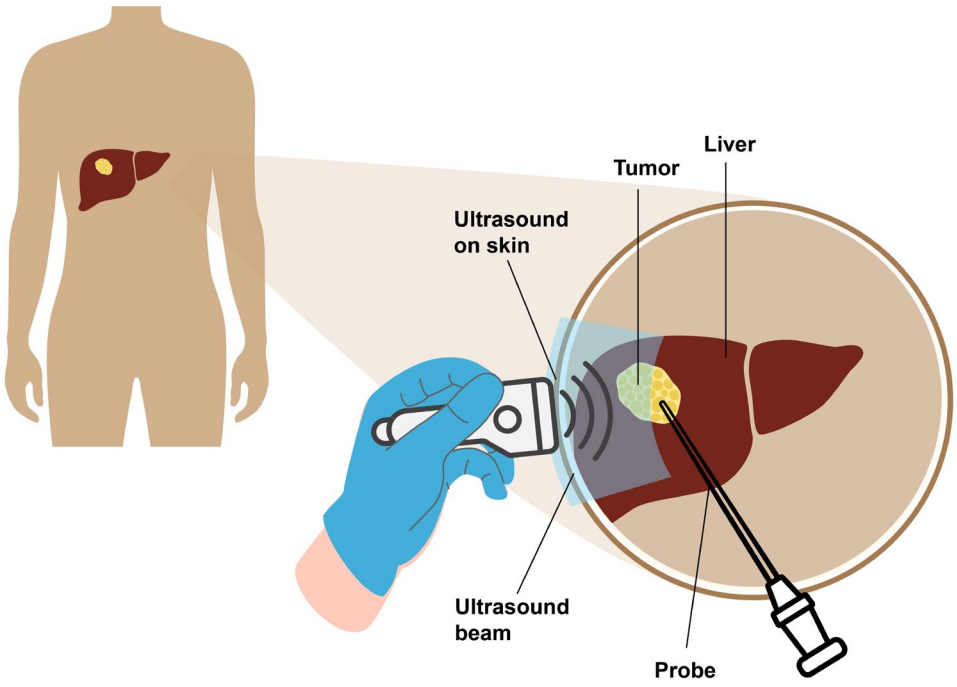
Direct therapy (also called arterially directed therapy) treats tumors by injecting particles, chemotherapy, or radioactive beads directly into the blood vessels that supply the tumor(s).

A small catheter is inserted into an artery and is guided to the tumor. Once in place, the particles, chemotherapy, or beads are injected. These treatments last a few days but act directly on the tumor's blood supply, and can be effective in reducing the tumor.

The common types of arterially directed therapy include:

- **Blocking blood flow (transarterial embolization)** involves injecting tiny particles into the blood vessels feeding the tumor(s). Stopping the blood flow cuts off the oxygen supply to the tumor and causes cancer cells to die.
- **Chemotherapy and blocking blood flow (transarterial chemoembolization)** involves injecting a chemotherapy mixture into the tumor to block the blood vessels connected to the tumor(s).
- **Chemotherapy beads (drug-eluting bead transarterial chemoembolization)** use tiny particles loaded with chemotherapy that are injected into the blood vessels feeding the tumor(s). The particles give off small

All types of ablation use a special needle, called a probe, which is inserted into the tumor. The probe is guided into place with a CT scan, ultrasound, or other type of imaging. The probe is removed afterward.



amounts of chemotherapy to the tumor over several days.

- **Radioactive beads (transarterial radioembolization)** use tiny glass or resin beads filled with a radioactive substance that are injected directly into the tumor(s). This procedure is often referred to as Y-90.

Depending on the circumstances, direct therapy may be used as a primary treatment, as a bridging treatment before a liver transplant, or for relieving pain.

The type of direct therapy recommended will depend on the size, number, and location of tumors, as well as your previous medical history and the expertise of your treating physicians.

Direct therapy has risks: it can cause liver function to worsen if the tumor's blood supply interferes with the liver's. It might not be used if your bilirubin level is above a certain level.

Radiation therapy

Radiation therapy uses high-energy x-rays, photons, protons, electrons, or other sources to kill cancer cells and shrink tumors. It can be given alone or with other treatments.

It might be used as supportive care or palliative care to help ease pain or discomfort caused by cancer, or to control bleeding caused by a tumor. Radiation therapy also may be a treatment for all tumors, regardless of location.

Most types of radiation include short treatment sessions that are given once daily over a few days to weeks. Ask your care team which radiation option(s) are best for you and what side effects to expect.

External beam radiation therapy

External beam radiation therapy uses a machine outside the body to aim radiation at tumor(s) or areas inside the body.

Common types that may be used to treat your cancer include:

- **Classic (stereotactic body) radiation therapy** uses high-energy radiation beams to kill or ablate the tumor. This can result in normal tissue receiving radiation as well, with some side effects depending on the location.
- **Shaped (intensity-modulated) radiation therapy** uses small beams of different strengths to match the shape of the tumor. This limits the amount of radiation to normal tissue.

Drug therapy

Drug therapy works throughout the body. Drug therapy might be used alone or with other therapies. Drug therapies used for liver cancer include targeted therapy and immunotherapy.

Goals of drug therapy should be discussed before starting treatment. Your wishes about treatment are important. Make your wishes known.

For a list of some drug therapies, see **Guide 3**.

Targeted therapy

Targeted therapy focuses on specific or unique features of cancer cells. Targeted therapies seek out how cancer cells grow, divide, and move in the body. These drugs stop or inhibit the action of molecules that help cancer cells grow and/or survive.

Targeted therapies may be used to treat tumors that have certain gene mutations. Larotrectinib (Vitrakvi) and entrectinib (Rozlytrek) might be used to target cancer that has a change in a gene called *NTRK*.

A biosimilar is an almost identical version of a drug made by another company. It's used in the same way and at the same dose as the original drug. Biosimilars for bevacizumab include Vegzelma, Mvasi, Zirabev, and Alymsys.

Immunotherapy

Immunotherapy is a type of systemic treatment that reactivates the immune system against tumor cells.

The immune system has many on and off switches. Tumors take advantage of "off switches." Two leading "off switches" are PD-1 and CTLA-4. Immunotherapy for liver cancer turns these "off switches" back on.

More information on immunotherapy side effects is available at NCCN.org/patientguidelines and on the NCCN Patient Guides for Cancer app.

Guide 3
Recommended drug therapies

Targeted therapy

- Bevacizumab (Avastin) or bevacizumab substitutes (biosimilars) such as Vegzelma, Mvasi, Zirabev, and Alymsys
- Cabozantinib (Cabometyx)
- Entrectinib (Rozlytrek)
- Larotrectinib (Vitrakvi)
- Lenvatinib (Lenvima)
- Regorafenib (Stivarga)
- Repotrectinib (Augtyro)
- Selpercatinib (Retevmo)
- Sorafenib (Nexavar)

Immunotherapy

- Atezolizumab (Tecentriq)
- Dostarlimab-gxly (Jemperli)
- Durvalumab (Imfinzi)
- Ipilimumab (Yervoy)
- Nivolumab (Opdivo)
- Pembrolizumab (Keytruda)
- Tremelimumab-actl (Imjudo)

Clinical trials

You might also obtain treatment through a clinical trial.

A clinical trial is a type of medical research study. After being developed and tested in a lab, potential new ways of fighting cancer need to be studied in people.

If found to be safe and effective in a clinical trial, a drug, device, or treatment approach may be approved by the U.S. Food and Drug Administration (FDA).

Everyone with cancer should carefully consider all of the treatment options available for their cancer type, including standard treatments and clinical trials. Talk to your health care provider about whether a clinical trial may make sense for you.

Phases

Most cancer clinical trials focus on treatment and are done in phases.

- **Phase 1** trials study the safety and side effects of an investigational drug or treatment approach.
- **Phase 2** trials study how well the drug or approach works against a specific type of cancer.
- **Phase 3** trials test the drug or approach against a standard treatment. If the results are good, it may be approved by the FDA.
- **Phase 4** trials study the safety and benefit of an FDA-approved treatment.

Finding a clinical trial

In the United States

NCCN Cancer Centers
NCCN.org/cancercenters

The National Cancer Institute (NCI)
cancer.gov/about-cancer/treatment/clinical-trials/search

Worldwide

The U.S. National Library of Medicine (NLM)
clinicaltrials.gov

Need help finding a clinical trial?

NCI's Cancer Information Service (CIS)
1.800.4.CANCER (1.800.422.6237)
cancer.gov/contact

Who can enroll?

It depends on the clinical trial's rules, called eligibility criteria. The rules may be about age, cancer type and stage, treatment history, or general health. They ensure that participants are alike in specific ways and that the trial is as safe as possible for the participants.

Informed consent

Clinical trials are managed by a research team. This group of experts will review the study with you in detail, including its purpose and the risks and benefits of joining. All of this information is also provided in an informed consent form. Read the form carefully and ask questions before signing it. Take time to discuss it with people you trust. Keep in mind that you can leave and seek treatment outside of the clinical trial at any time.

Will I get a placebo?

Placebos (inactive versions of real medicines) are almost never used alone in cancer clinical trials. It's common to receive either a placebo with a standard treatment, or a new drug with a standard treatment. You'll be informed, verbally and in writing, if a placebo is part of a clinical trial before you enroll.

Are clinical trials free?

There is no fee to enroll in a clinical trial. The study sponsor pays for research-related costs, including the study drug. But you may need to pay for other services, like transportation or childcare, due to extra appointments. During the trial, you'll continue to receive standard cancer care. This care is often covered by insurance.

Supportive/palliative care

Supportive care, also known as palliative care, helps improve your quality of life during and after cancer treatment. The goal is to prevent or manage side effects and symptoms, like pain and cancer-related fatigue. It also addresses the mental, social, and spiritual concerns faced by those with cancer.

Supportive care is available to everyone with cancer and their families, not just those at the end of life. It's not the same thing as hospice, although a goal of hospice care is relieving pain and discomfort.

Supportive care can also help with:

- Making treatment decisions
- Coordinating your care
- Paying for care
- Planning for advanced care and end of life

Survivorship

A person is a cancer survivor from the time of diagnosis until the end of life. When treatment leads to remission (no evidence of disease), you'll need follow-up or survivorship care for late effects.

During survivorship care you'll still have a care team, but it'll look different. Seek out peer support groups, whether online or in person.

Side effects

All cancer treatments can cause unwanted health issues called side effects. Side effects depend on many factors. These factors include the drug type and dose, length of treatment, and the person.

Treatment can cause several side effects. Some side effects are very serious and may be harmful to your health. Others may just be

unpleasant. You'll be monitored closely for side effects.

Ask for a complete list of side effects of each treatment. Also, tell your treatment team if you have any new or worsening symptoms. There may be ways to help you feel better. There are also ways to prevent some side effects.

Late effects

Late effects are side effects that occur months or years after a disease is diagnosed or after treatment has ended. Late effects may be caused by cancer or cancer treatment.

They may include physical, mental, and social problems, as well as second cancers. The sooner late effects are treated, the better. Ask your care team about what late effects could occur. This will help you know what to look for.

Blocked bile duct

A tumor in the liver may grow large enough to block your bile duct. A bile duct is a small tube that drains digestive fluid (bile) from the liver.

A blocked duct causes bile to build up in the liver. As a result, you may have pain, itching, discomfort, and/or yellowing of the skin and eyes. This is called jaundice. This blockage can cause an infection of the bile duct, called cholangitis.

A blocked bile duct may be treated by placing a biliary stent or doing a biliary bypass.

A biliary stent is a tiny tube that is placed in the bile duct to unblock it or keep it open. Before the stent can be placed, bile may need to be drained through an opening in the side of the body. You may need a new or second stent during or after cancer treatment if the tumor grows.

A biliary bypass is a surgery to re-route the flow of bile from the common bile duct into the small intestine. The result is that the bile flow avoids (bypasses) the blocked part of the duct.

Difficulty eating

Sometimes side effects from surgery, cancer, or its treatment might cause you to feel not hungry or sick to your stomach (nauseated). You might have a sore mouth.

Healthy eating is important during treatment. It includes eating a balanced diet, eating the right amount of food, and drinking enough fluids. A registered dietitian who's an expert in nutrition and food can help.

Speak to your care team if you have trouble eating or maintaining weight.

Distress

Depression, anxiety, and sleeping issues are common and are a normal part of a cancer diagnosis. Talk to your care team and with those whom you feel most comfortable about how you're feeling.

There are services, people, and medicine that can help you. Support and counseling services are available.

Fatigue

Fatigue is extreme tiredness and an inability to function due to lack of energy. Fatigue may be caused by cancer or by a side effect of treatment. Let your care team know how you're feeling and if fatigue is getting in the way of doing the things you enjoy.

Eating a balanced diet, exercise, yoga, acupuncture, and massage therapy may help. You might be referred to a nutritionist or dietitian to help with fatigue.

Pain

Tell your care team about any pain or discomfort. You might meet with a palliative care specialist or with a pain specialist to manage pain.

Fluid buildup in the abdomen

If there is fluid building up in your abdomen because your liver is not working properly, ask your team about treatment options such as medications (diuretics) and fluid removal (paracentesis).

Key points

- Systemic drug therapy works throughout the body. It includes chemotherapy, targeted therapy, and immunotherapy.
- Ablation is a type of treatment that uses extreme cold or heat, radio waves, microwaves, or chemicals to destroy cancer cells.
- Arterially directed therapy treats tumors by injecting particles, chemotherapy, or radioactive beads directly into the blood vessels that supply the tumor(s).
- Radiation therapy uses high-energy x-rays, protons, or other radioactive waves to kill cancer cells and shrink tumors.
- A clinical trial is a type of research that studies a treatment to see how safe it is and how well it works.
- Supportive care is health care that relieves symptoms caused by cancer or its treatment and improves quality of life. Supportive care is available at any time.
- All cancer treatments can cause unwanted health issues called side effects. Tell your care team about all your side effects so they can be managed.

Questions to ask

- When will I start treatment?
- How long will treatment likely take?
- What should I expect from treatment?
- What will you do to make me comfortable during treatment?
- How much will my insurance pay for treatment?

4
Removable liver cancer

This chapter is for people whose tumor might be removable with surgery (resectable) or those who may be eligible for a liver transplant. Together, you and your care team will choose a treatment plan that is best for you.

Your care team thinks they might be able to remove your liver tumor with surgery. This is called a *resectable* form of liver cancer. The requirements for removing liver cancer tumors are listed below.

Removal requirements

Tumor removal may be an option for you if you have:

- Child-Turcotte-Pugh Class A
- No increased pressure in the main vein supplying blood to the liver (portal hypertension)
- A tumor in a location that's easy to access by surgery
- Enough functioning and healthy non-cancerous liver cells after surgery
- Enough liver tissue left over after the surgery to work
- You're healthy enough to have the procedure

When possible, surgery is the preferred method to remove the tumor. Preferred therapies have the most evidence that they work better and may be safer than other therapies.

Resectable tumors can also be treated with ablation, arterially directed therapy, or radiation therapy.

There are many reasons why resection might not be the best choice for your situation. Ask your care team about this.

Liver transplant requirements

Transplant may be an option for you if:

- Your alpha-fetoprotein (AFP) level is 1,000 ng/mL or less
- Your tumor is 2 to 5 cm in diameter (the size of a lime or smaller), or you have 2 to 3 tumors that are 1 to 3 cm each (the size of a grape or smaller)
- Your large veins, arteries, or bile ducts have no cancer (no macrovascular involvement)
- Cancer is only found in your liver; your other organs have no cancer
- You're healthy enough to have the procedure

If a liver transplant is an option for you, then you'll be referred to a liver transplant center that has an experienced transplant team. There, you'll receive bridging therapy. Once the transplant is complete, you'll also receive medicine to prevent your body from rejecting the donor liver.

No transplant

If a liver transplant isn't an option for you, then the preferred treatment is surgery to remove the tumor (resection). Other options include ablation, arterially directed therapy, and radiation therapy.

Follow-up testing

After treatment, you'll start regular follow-up testing to watch for signs that cancer has returned or that your body is rejecting the donor liver (also called surveillance).

Imaging tests and blood tests to look for AFP will be needed. If you have hepatitis, you might be referred to a hepatologist to discuss antiviral treatment options.

Follow-up tests will be done every 3 to 6 months for 2 years, then every 6 months for at least 5 years.

Key points

- A tumor that can be removed completely with surgery is called resectable. Surgery is the preferred method to remove the tumor.
- Removable tumors can also be treated with ablation, arterially directed therapy, or radiation therapy.
- A liver transplant might be an option if you meet certain UNOS criteria.
- If a liver transplant is an option, you might have bridging therapy while waiting for a transplant.
- Bridging therapy might include ablation, arterially directed therapy (embolization), radiation therapy, or systemic drug therapy.
- Surveillance consists of regular testing to watch for signs that cancer has returned or the liver is being rejected.

Questions to ask

- How much of my liver will be removed?
- What other organs or tissues might be removed during surgery?
- What are the chances you can remove the whole tumor, and I'll have a negative margin?

5
Unremovable liver cancer

Surgery for liver cancer isn't always possible. Sometimes, the location of the tumor prevents surgery. Other times, the liver isn't healthy enough for resection. A tumor that can't be removed with surgery is called unresectable.

If your tumor can't be removed with surgery, then your cancer is considered *unresectable* or unremovable. Even if you can't have surgery to remove just the tumor, that doesn't mean there are no options.

This chapter explains the requirements for a total liver transplant and non-surgical treatments.

Liver transplant requirements

If the cancer responds to other therapies, such as medicine or radiation, you might still be a candidate for a transplant.

A liver transplant may be an option for you if:

- Your alpha-fetoprotein level (AFP) is 1,000 ng/mL or less
- Your tumor is 2 to 5 cm in diameter (the size of a lime or smaller), or you have 2 to 3 tumors that are 1 to 3 cm each (the size of a grape or smaller)
- Your large veins, arteries, or bile ducts have no cancer
- Cancer is only found in your liver; your other organs have no cancer

For more information on liver transplants, you can turn to the previous chapter (*Removable liver cancer*).

Follow-up testing

After a liver transplant, you'll start follow-up testing regularly to watch for signs that cancer has returned or that your body doesn't reject the donor liver. This is called surveillance.

Imaging tests and blood tests to look AFP are needed. Tests are usually done every 3 to 6 months for 2 years, then every 6 months for at least 5 years.

Treatment without surgery

Not everyone is healthy enough for a liver transplant. Surgery such as resection or partial hepatectomy might not be possible because of the location of the tumor or the health of your liver. Or you may simply not want a liver transplant for other reasons.

There's also the possibility that you'll need to shrink the tumor slightly before you can have a transplant; these treatments below might accomplish that.

You should be able to receive treatment with one or more of these options:

Locoregional therapy

Locoregional therapy focuses on the cancer and the area or region around it. Treatments include ablation, direct therapy, and radiation therapy. These are the preferred treatment options for those not receiving a liver transplant and with cancer only in their liver. Preferred therapies have the most evidence that they work better and may be safer than other therapies.

Clinical trial

A clinical trial might be an option. Clinical trials offer the best standard of liver cancer care while testing new therapies that may be able to help you. Ask your care team for more information.

Systemic drug therapy

Systemic drug therapy is drug therapy that works throughout the body. Systemic drug therapy options for unresectable liver cancer are the same ones used to treat metastatic disease. *See Chapter 6: Metastatic liver cancer.*

Supportive care

Supportive care relieves the symptoms caused by cancer and the side effects caused by cancer treatment. Supportive care isn't for treating cancer, but for improving your quality of life. You can have supportive care while having cancer treatment.

Cancer progression

When cancer grows or spreads, it's called progression. Progression can happen during or after your systemic drug therapy.

Treatment for progression is based on the type of systemic drug therapy you had before. You might have a different drug in the same category, or you might try a new type of drug altogether.

Systemic drug therapy options for cancer progression are the same as those used to treat metastatic disease. *See Chapter 6: Metastatic liver cancer*.

Key points

- A tumor that cannot be removed with surgery is called unresectable.
- A liver transplant might be an option for you if you meet certain requirements.
- After a liver transplant, you'll undergo surveillance. Surveillance consists of regular testing to watch for tumor growth and checking the liver for signs of rejection.
- If a liver transplant isn't an option for you, or to prevent the tumor from growing while you're on a transplant list, then the preferred treatment is locoregional therapy such as ablation, arterially directed therapy, or radiation therapy.
- Systemic drug therapy or a clinical trial are other options for those not undergoing a liver transplant.
- Supportive care is always available for anyone, regardless of cancer status.
- When cancer grows or spreads, it's called disease progression. Progression can happen during or after drug therapy.

Questions to ask

- How long will recovery take, and what should I expect?
- How much pain will I have? What will be done to manage my pain?
- What supportive care options are available to me?

6
Metastatic liver cancer

Stage 4B liver cancer is metastatic liver cancer. This is cancer that has spread from the liver to distant sites in the body. The goals of treatment are to reduce the amount of cancer and to prevent further spread.

Metastatic liver cancer has spread outside the liver to further areas of the body, such as the lungs or bones. Before you can start treatment, you'll need a biopsy to confirm that there are metastases.

Treatment options

The goals of treatment are to reduce the amount of cancer in the body (called cancer burden) and to prevent it from spreading further. Treatment options include a clinical trial, supportive care, or systemic drug therapy.

Systemic drug therapy

Systemic drug therapy works throughout the body. Preferred treatment options are based on your Child-Turcotte-Pugh class and other factors. Ask your medical oncologist why one drug might be chosen over another.

First-line options are the treatments given first. The preferred first-line systemic drug therapy options are atezolizumab with bevacizumab or tremelimumab-actl with durvalumab. Preferred therapies have the most evidence that they work better and may be safer than other therapies.

A substitute (biosimilar) drug might be used for bevacizumab. A biosimilar is an almost identical drug made by another company. It's used in the same way and at the same dose as bevacizumab.

Guide 4
First-line systemic drug therapy options for metastatic liver cancer

Preferred treatments	• Atezolizumab with bevacizumab* • Tremelimumab-actl with durvalumab
Other recommended treatments	• Durvalumab • Lenvatinib • Sorafenib • Tislelizumab-jsgr • Nivolumab with ipilimumab • Pembrolizumab

*A biosimilar might be used instead of bevacizumab.

For all first-line systemic drug therapy options, see **Guide 4**.

Clinical trial

A clinical trial is an option worth considering for any stage of cancer, not just metastatic cancer. It's a recommended option for those with metastatic cancer. Ask your care team for more information.

Supportive care

Supportive care is used to relieve the symptoms of cancer and the side effects of cancer treatment. Supportive care isn't for treating cancer, but for improving your quality of life. You can have supportive care while still having cancer treatment.

Cancer progression

When cancer grows or spreads, it's called progression. If first-line systemic drug therapy doesn't stop the growth or spread of cancer, then more lines of therapy might be given.

Treatment is based on the type of drug therapy you had before. You may have a drug in the same family that you haven't had before, or you might try a new drug if all other options haven't worked.

For next-line systemic drug therapy options, see **Guide 5**.

Guide 5
Next-line systemic drug therapy options for metastatic liver cancer

Options	• Cabozantinib • Regorafenib
Other recommended treatments	Any of the treatments in **Guide 4**
Treatments used in certain cases	• Larotrectinib, repotrectinib, or entrectinib for *NTRK* gene fusion-positive tumors • Nivolumab • Ramucirumab

What's next?

Metastatic liver cancer is very serious, and you have many options to treat it. Always be mindful that your thoughts and opinions matter when it comes to your treatment. Speak up when you don't feel comfortable doing something.

Key points

- Stage 4B liver cancer is metastatic liver cancer. It's cancer that has spread to distant sites such as the lungs or bones.
- The goal of treatment is to reduce the amount of cancer in the body, called cancer burden, and to prevent the further spread of cancer.
- First-line options are the treatments given first. The preferred first-line systemic drug therapy is atezolizumab with bevacizumab or tremelimumab-actl with durvalumab.
- A substitute (biosimilar) might be used instead of bevacizumab.

Questions to ask

- Are there programs to help me pay for treatment?
- What are the chances my cancer will return after treatment?
- How many lines of treatment will I need? How many am I allowed to have?
- How can I be made more comfortable while we treat my cancer?

We want your feedback!

Our goal is to provide helpful and easy-to-understand information on cancer. Take our survey to let us know what we got right and what we could do better.
NCCN.org/patients/feedback

7
Other resources

Want to learn more? Here's how you can get additional help.

What else to know

This book can help you improve your cancer care. It plainly explains expert recommendations and suggests questions to ask your care team. But it's not the only resource that you have.

You're welcome to receive as much information and help as you need. Many people are interested in learning more about:

- The details of their health and treatment
- Being a part of a care team
- Getting financial help
- Finding a care provider who's an expert in lung cancer
- Coping with health problems
- Issues with transplants or ways to get onto the transplant list

What else to do

Your health care center can help you with next steps. They often have on-site resources to help meet your needs and find answers to your questions. Health care centers can also inform you of resources in your community.

In addition to help from your providers, the resources listed in the next section provide support for many people like yourself. Look through the list and visit the provided websites to learn more about these organizations.

Where to get help

Blue Faery
Bluefaery.org

Cancer*Care*
Cancercare.org

Cancer Hope Network
Cancerhopenetwork.org

Cholangiocarcinoma Foundation
Cholangiocarcinoma.org

Gallbladder Cancer Foundation
Gallbladdercancer.org

Global Liver Institute
Globalliver.org

GRACE
Cancergrace.org

Imerman Angels
Imermanangels.org

National Coalition for Cancer Survivorship
Canceradvocacy.org

Triage Cancer
Triagecancer.org

Questions to ask yourself

- How can I find someone to stay with me after surgery?
- Do I feel safe and secure at home, at work, and/or in my neighborhood?
- What concerns do I have about stress, money, work, health, and/or relationships?
- Do I have a support network of family, friends, neighbors, and/or coworkers?
- How can I build a support system?

Words to know

ablation
A treatment that destroys very small tumors with heat, cold, lasers, or chemicals. Also called ablative therapy.

alpha-fetoprotein (AFP)
A protein that can be elevated in those with liver cancer.

arterially directed therapy
Treats tumors by injecting particles, chemotherapy, or radioactive beads directly into the blood vessels that supply the tumor(s).

bile
A yellowish-brown fluid that is made by the liver and helps to digest food.

bile duct
A small tube-shaped structure that drains digestive fluid (bile) from the liver.

bilirubin
A yellow-brown substance that is part of a digestive fluid called bile.

biopsy
A procedure that removes fluid or tissue samples to be tested for a disease.

biosimilar
An almost identical version of a drug made by another company. It is used in the same way and at the same dose as the original drug.

blood clot
A thickened mass of blood. Also called a thrombosis.

blood vessel
A tube-shaped structure that carries blood throughout the body.

bypass
An operation to re-route the flow of fluid in the body.

cancer antigen 19-9 (CA 19-9)
A protein made by certain cancer cells and found in blood.

cancer stage
A rating of the growth and spread of cancer.

carcinoembryonic antigen (CEA)
A protein that is present when some types of cancer form.

chemotherapy
Drugs that kill fast-dividing cells throughout the body, including cancer cells and some normal cells.

cholangitis
An infection of the vessels that drain digestive fluid from the liver (bile ducts).

cirrhosis
Scarring of the liver from chronic liver disease that may affect the function of the liver.

clinical trial
Research on a test or treatment to assess its safety or how well it works.

computed tomography (CT)
A test that combines many x-rays to make pictures of the inside of the body.

contrast
A substance put into your body to make clearer pictures during imaging tests.

core needle biopsy
A procedure that removes tissue samples with a hollow needle. Also called core biopsy.

donor
A person who gives their organs, tissues, or cells to another person.

embolization
A treatment that blocks blood supply to tumors with beads inserted into an artery.

external beam radiation therapy
A cancer treatment with radiation received from a machine outside the body.

fine-needle aspiration
Removal of a tissue sample with a thin needle.

gallbladder
A small organ that holds digestive fluid (bile) from the liver.

gastroenterologist
A health care provider who is an expert in digestive diseases.

hepatologist
A health care provider who is an expert in treating diseases of the liver, gallbladder, bile ducts, and pancreas.

hepatoma
Another term for hepatocellular carcinoma, primary liver cancer.

histology
The structure of cells, tissue, and organs as viewed under a microscope.

immune system
The body's natural defense against infection and disease.

immunotherapy
A treatment with drugs that helps the body find and destroy cancer cells.

intravenous (IV)
A method of giving drugs by a needle or tube inserted into a vein.

jaundice
Yellow-colored skin or eyes due to a buildup of bilirubin in the body.

laparoscopy
Use of a thin tool inserted through a cut made into the belly area.

lymph
A clear fluid containing white blood cells.

lymph node
A small group of disease-fighting cells located throughout the body.

magnetic resonance imaging (MRI)
A test that uses radio waves and powerful magnets to make pictures of the insides of the body.

medical oncologist
A health care provider who's an expert in cancer drugs.

metastasis
The spread of cancer cells from the first (primary) tumor to a new site.

microsatellite instability (MSI)
Errors made in small, repeated DNA parts during the copy process because of an abnormal repair system.

microsatellite instability-high (MSI-H)
Mutations in 30% or more microsatellites.

mutation
An abnormal change.

negative margin
When a tumor is removed completely, with no cancer remaining.

oncologist
A health care provider who is an expert in the treatment of cancer.

palliative care
Health care that includes symptom relief but not cancer treatment. Also sometimes called supportive care.

partial hepatectomy
Surgery to remove a portion of the liver.

pathologist
A health care provider who's an expert in examining tissue and cells to find disease.

performance status
A rating of one's ability to do daily activities.

positive margin
When a tumor is removed surgically and some tumor cells are left behind.

positron emission tomography (PET)
A test that uses radioactive material to see the shape and function of body parts.

primary treatment
The main treatment used to rid the body of cancer.

prognosis
The likely course and outcome of a disease based on tests.

progression
The growth or spread of cancer after being tested or treated.

radiation oncologist
A health care provider who's an expert in radiation treatment.

radiation therapy
A treatment that uses high-energy rays to destroy cancer cells.

radiologist
A health care provider who is an expert in imaging tests.

recurrence
The return of cancer after a cancer-free period.

resectable
Cancer that can be removed with surgery.

risk factor
Something that increases the chance of getting a disease.

side effect
An unhealthy or unpleasant physical or emotional response to treatment.

standard of care
The best-known way to treat a particular disease, based on past clinical trials. There may be more than one treatment that is considered standard of care.

subtype
A smaller group within a type of cancer that is based on certain cell features.

supportive care
Health care that includes symptom relief but not cancer treatment. Also called palliative care.

surgical margin
The normal-looking tissue around the edge of a tumor removed during surgery.

surgical oncologist
A surgeon who's an expert in performing surgical procedures in patients with cancer.

targeted therapy
Drugs that stop the growth process specific to cancer cells.

ultrasound
A test that uses sound waves to take pictures of the insides of the body.

unresectable
Cancer that can't be removed by surgery.

NCCN Contributors

This patient guide is based on the NCCN Clinical Practice Guidelines in Oncology (NCCN Guidelines®) for Hepatocellular Carcinoma, Version 1.2025. It was adapted, reviewed, and published with help from the following people:

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Philadelphia, Pennsylvania
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Case Comprehensive Cancer Center/
University Hospitals Seidman Cancer Center and
Cleveland Clinic Taussig Cancer Institute
Cleveland, Ohio
UH Seidman Cancer Center
800.641.2422 • uhhospitals.org/services/cancer-services
CC Taussig Cancer Institute
866.223.8100 • my.clevelandclinic.org/departments/cancer
Case CCC
216.844.8797 • case.edu/cancer

City of Hope National Medical Center
Duarte, California
800.826.4673 • cityofhope.org

Dana-Farber/Brigham and Women's Cancer Center |
Mass General Cancer Center
Boston, Massachusetts
877.442.3324 • youhaveus.org
617.726.5130 • massgeneral.org/cancer-center

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888.275.3853 • dukecancerinstitute.org

Fox Chase Cancer Center
Philadelphia, Pennsylvania
888.369.2427 • foxchase.org

Fred & Pamela Buffett Cancer Center
Omaha, Nebraska
402.559.5600 • unmc.edu/cancercenter

Fred Hutchinson Cancer Center
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206.667.5000 • fredhutch.org

Huntsman Cancer Institute at the University of Utah
Salt Lake City, Utah
800.824.2073 • healthcare.utah.edu/huntsmancancerinstitute

Indiana University Melvin and Bren Simon
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Indianapolis, Indiana
888.600.4822 • www.cancer.iu.edu

Johns Hopkins Kimmel Cancer Center
Baltimore, Maryland
410.955.8964
www.hopkinskimmelcancercenter.org

Mayo Clinic Comprehensive Cancer Center
Phoenix/Scottsdale, Arizona
Jacksonville, Florida
Rochester, Minnesota
480.301.8000 • Arizona
904.953.0853 • Florida
507.538.3270 • Minnesota
mayoclinic.org/cancercenter

Memorial Sloan Kettering Cancer Center
New York, New York
800.525.2225 • mskcc.org

Moffitt Cancer Center
Tampa, Florida
888.663.3488 • moffitt.org

O'Neal Comprehensive Cancer Center at UAB
Birmingham, Alabama
800.822.0933 • uab.edu/onealcancercenter

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866.587.4322 • cancer.northwestern.edu

Roswell Park Comprehensive Cancer Center
Buffalo, New York
877.275.7724 • roswellpark.org

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St. Louis, Missouri
800.600.3606 • siteman.wustl.edu

St. Jude Children's Research Hospital/
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901.448.5500 • uthsc.edu

Stanford Cancer Institute
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608.265.1700 • uwhealth.org/cancer

UT Southwestern Simmons Comprehensive Cancer Center
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Vanderbilt-Ingram Cancer Center
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