PROCEDURE

Liver cancer treatment

Liver cancer treatment uses surgery, targeted procedures, radiation, or medicines to remove, destroy, or control cancer.

PURPOSE
Remove, destroy, or control cancer while preserving liver function

PROCEDURE TYPE
Therapeutic; surgical, minimally invasive, interventional radiology, radiation, or medicines

WHERE IT IS DONE
Operating theatre, radiology suite, clinic, or hospital ward

ANAESTHESIA
Local with sedation, general anaesthesia, or none for medicines

HOW LONG IT TAKES
About 30 minutes to several hours, based on treatment

PREPARATION
Blood tests, imaging, medicine review, and sometimes fasting

RECOVERY
Same day to several days; no driving after sedation

MAIN RISKS
Bleeding, infection, liver injury, and treatment-specific side effects

RESULTS
Pathology in days; treatment response on later scans

Overview

Liver cancer treatment is not one single procedure. It may involve surgery, a liver transplant, treatments delivered through needles or blood vessels, radiation, cancer medicines, or a combination of these.

This article focuses mainly on primary liver cancer, especially hepatocellular carcinoma, or HCC. HCC begins in liver cells. Cancer that has spread to the liver from another organ is treated according to where it started. Cancer arising in the liver's bile ducts also has a different treatment plan.

Your options are based on the number, size, and location of tumours; whether cancer has spread; and how well your liver works. Cirrhosis, which is long-term scarring of the liver, can limit which treatments are safe.

A multidisciplinary team usually plans treatment. This may include liver surgeons, cancer specialists, interventional radiologists, transplant specialists, and nurses.

Why the procedure is performed

Treatment may aim to remove or destroy all known cancer. This is most likely when the cancer is limited to the liver and enough healthy liver can remain afterward.

Possible treatment goals include:

Some treatments are used before a liver transplant to keep the cancer controlled. Others may shrink cancer enough to make another treatment possible.

- Removing a tumour and part of the liver through liver resection
- Replacing the liver through transplantation
- Destroying small tumours with heat, cold, radiation, or injected substances
- Blocking a tumour's blood supply, sometimes while delivering chemotherapy or radiation
- Shrinking or controlling cancer with radiation or medicines
- Relieving symptoms and slowing cancer when cure is not possible

Who should and should not have it

Liver resection may be suitable when cancer is limited and the remaining liver is expected to work well. Transplantation may be considered for selected people whose cancer and liver disease meet transplant criteria.

Ablation, which destroys a tumour through a needle or probe, is often considered for small tumours when surgery is not suitable. Embolization may be offered when cancer is mainly within the liver but cannot be removed. Radiation and cancer medicines can be used at several stages.

A particular treatment may be avoided or delayed if:

Liver transplantation is not suitable for everyone. Eligibility is affected by tumour features, general health, transplant programme criteria, and donor organ availability.

These limits do not always mean that no treatment is possible. Another local treatment, medicine, clinical trial, or symptom-focused approach may be more appropriate.

- Too little working liver would remain afterward

- Cancer size, location, or spread makes that treatment unlikely to help
- An infection is not yet controlled
- Blood clotting problems create an unacceptable bleeding risk
- Heart, lung, or kidney problems make anaesthesia, contrast dye, or treatment unsafe
- Pregnancy could expose a fetus to radiation or harmful medicines
- The liver is too fragile for the proposed treatment

How to prepare

Your treating facility's own instructions take priority because preparation differs between surgery, ablation, embolization, radiation, and medicine treatment.

You may need blood tests to check liver and kidney function, blood cell counts, and clotting. Imaging such as CT or MRI helps the team map the tumour and nearby blood vessels.

Give the team a complete list of medicines, supplements, allergies, and previous reactions to anaesthesia or contrast dye. Blood thinners and some diabetes medicines may need adjustment. Do not stop them unless the treating team tells you how and when.

Before a procedure involving sedation or general anaesthesia, you will usually be told when to stop eating and drinking. Arrange for an adult to take you home if discharge is planned for the same day.

Preparation for major liver surgery or transplant may also include heart and lung testing, nutrition advice, and assessment of the support you will need during recovery.

What happens during the procedure

The steps depend on the treatment.

During liver resection, you receive general anaesthesia and are fully unconscious. The surgeon removes the tumour with a margin of nearby liver tissue. Surgery may be open or performed through several smaller cuts.

During liver transplantation, the diseased liver is removed and replaced with a donor liver. This is major surgery followed by lifelong medicines that reduce the immune system's ability to reject the new liver.

For ablation, imaging guides a needle or probe into the tumour. Heat is most commonly used to destroy cancer cells. You may receive general anaesthesia or local anaesthetic with sedation.

During embolization, an interventional radiologist passes a thin tube through an artery, usually from the wrist or groin, into blood vessels supplying the tumour. Tiny particles block the blood flow. Some procedures also deliver chemotherapy, called chemoembolization, or radioactive beads, called radioembolization.

External-beam radiation directs carefully planned radiation at the tumour from outside your body. Treatment may be given in one or several sessions. You are awake and do not feel the radiation itself.

Cancer medicines may be given as tablets or through a vein. These include targeted treatments, which interfere with features cancer uses to grow, and immunotherapy, which helps the immune system attack cancer.

Recovery and what to expect afterward

Pain ranges from mild soreness after a needle or catheter procedure to stronger pain after surgery. Your team will provide a pain-control plan. Tell them if pain is worsening or not controlled.

Eating often resumes gradually. After a minor procedure, you may drink and eat within hours. Major surgery may require fluids at first, followed by solid food as your bowel function returns. Nausea, reduced appetite, or tiredness can occur.

Activity restrictions reflect the treatment. Walking is encouraged after most procedures, but heavy lifting may be restricted after catheter treatment or surgery. Recovery after ablation or embolization may take several days. Recovery after liver resection or transplantation takes much longer.

Do not drive on the day of sedation or general anaesthesia. Follow the facility's instructions about when driving is safe again. You should not drive while taking medicines that make you drowsy.

Return to work may be possible within days after some minimally invasive treatments. Major surgery may require several weeks or longer. Cancer medicines and radiation can also affect energy and work schedules.

Risks and possible complications

All treatments have risks, but the type and likelihood differ.

Surgery can cause bleeding, infection, blood clots, bile leakage, pneumonia, or reduced liver

function. Liver failure is a serious possible complication when the remaining liver cannot meet the body's needs.

Ablation can cause pain, bleeding, infection, or injury to nearby structures. Embolization may cause pain, fever, nausea, fatigue, or temporary worsening of liver function. Radiation can affect healthy liver tissue and nearby organs.

Cancer medicines may cause fatigue, diarrhoea, skin changes, high blood pressure, bleeding, or changes in liver function. Immunotherapy can make the immune system inflame healthy organs, including the liver, lungs, bowel, thyroid, or skin.

Your team should explain the risks specific to the treatment and how your liver function affects them.

Results and follow up

If tissue is removed, a pathologist examines it under a microscope. Results are commonly available within several days, although complex testing can take longer. The report may describe the cancer type, tumour size, and whether cancer reaches the cut edge of the specimen.

After ablation, embolization, radiation, or medicine treatment, scans are used to assess whether the tumour has shrunk, stopped growing, or lost its blood supply. This usually cannot be judged immediately.

Routine follow-up may include appointments, blood tests, liver function tests, tumour-marker tests, and CT or MRI scans. Continued monitoring matters because liver cancer can return or new tumours can develop in a scarred liver.

If you have cirrhosis, hepatitis, or another liver condition, its treatment remains part of your follow-up care.

Alternatives

The real alternatives depend on the cancer and the health of your liver.

Liver resection avoids waiting for a donor organ, but it leaves the underlying liver disease in place. Transplantation treats both the cancer and the diseased liver, but eligibility is limited and a donor organ may not be available quickly.

Ablation uses smaller incisions and usually allows faster recovery than surgery. However, it may be less reliable for larger tumours or tumours near major blood vessels or other organs.

Embolization can treat tumours that cannot be removed, but it does not remove the cancer and may worsen liver function. External-beam radiation avoids an operation, although it may require several visits and can damage nearby healthy tissue.

Systemic medicines treat cancer throughout the body, including disease outside the liver. They can cause whole-body side effects and usually aim to control rather than physically remove the tumour.

A clinical trial may provide access to a newer treatment, but its benefits and risks may be less certain. Supportive care without cancer-directed treatment is also an option. It focuses on comfort, symptoms, and quality of life rather than shrinking the cancer.

When to call your healthcare team

Contact your healthcare team promptly for increasing pain, repeated vomiting, worsening abdominal swelling, a new fever, redness or drainage from an incision, yellowing of the skin or eyes, or side effects that interfere with drinking, eating, or taking medicines.

Seek emergency help for:

Keep routine follow-up appointments even when you feel well. These visits are used to check liver function, manage side effects, and look for treatment response or recurrence.

- Trouble breathing or chest pain
- Heavy bleeding or vomiting blood
- Black, tar-like bowel movements
- Fainting, severe weakness, or new confusion
- Sudden severe abdominal pain
- Signs of a severe allergic reaction, such as facial swelling

Common questions

Will I be asleep?

You will be asleep under general anaesthesia for liver resection or transplant. Ablation and embolization may use sedation or general anaesthesia. Radiation and most medicine treatments do not require anaesthesia.

Can I drive home?

Not after sedation or general anaesthesia. Arrange for an adult to take you home. Major

surgery requires a hospital stay, and driving resumes only when movement, concentration, and pain control are safe.

How painful is liver cancer treatment?

Needle and catheter procedures commonly cause soreness or temporary abdominal pain. Surgery causes more pain but includes planned pain relief. Radiation itself is painless, though later side effects can occur.

When will I know whether it worked?

Surgical pathology usually takes several days. The effect of ablation, embolization, radiation, or medicines is assessed with follow-up scans, often weeks later.

Will I need more than one treatment?

Possibly. Some treatments require several sessions, and different approaches may be combined. Further treatment may also be needed if cancer remains, returns, or appears elsewhere.

Sources

- National Cancer Institute. Adult Primary Liver Cancer Treatment (PDQ®)-Patient Version
- Rinella ME, Neuschwander-Tetri BA, Siddiqui MS, et al. AASLD Practice Guidance on prevention, diagnosis, and treatment of hepatocellular carcinoma. Hepatology . 2023;78(6):1922-1965
- Dawson LA, Winter KA, Knox JJ, et al. Radiation Therapy for Hepatocellular Carcinoma: An ASTRO Clinical Practice Guideline. Practical Radiation Oncology . 2022;12(1):28-51
- American Cancer Society. Treatment of Liver Cancer, by Stage
- NHS. Treatment for liver cancer