

Understanding Liver Cancer

A guide for people with cancer, their families and friends



For information & support, call **13 11 20**

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Understanding Liver Cancer is reviewed approximately every two years.

Check the publication date above to ensure this copy is up to date.

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Note to reader

Always consult your doctor about matters that affect your health. This booklet is intended as a general introduction to the topic and should not be seen as a substitute for medical, legal or financial advice. You should obtain independent advice relevant to your specific situation from appropriate professionals, and you may wish to discuss issues raised in this booklet with them.

All care is taken to ensure that the information in this booklet is accurate at the time of publication. Please note that information on cancer, including the diagnosis, treatment and prevention of cancer, is constantly being updated and revised by medical professionals and the research community. Cancer Council Australia and its members exclude all liability for any injury, loss or damage incurred by use of or reliance on the information provided in this booklet.

Cancer Council

Cancer Council is Australia's peak non-government cancer control organisation. Through the eight state and territory Cancer Councils, we provide a broad range of programs and services to help improve the quality of life of people living with cancer, their families and friends. Cancer Councils also invest heavily in research and prevention. To make a donation and help us beat cancer, visit cancer.org.au or call your local Cancer Council.



Cancer Council acknowledges Traditional Custodians of Country throughout Australia and recognises the continuing connection to lands, waters and communities. We pay our respects to Aboriginal and Torres Strait Islander cultures and to Elders past, present and emerging.



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About this booklet

This booklet has been prepared to help you understand more about primary liver cancer (hepatocellular carcinoma).

Many people feel shocked and upset when told they have primary liver cancer. We hope this booklet will help you, your family and friends understand how primary liver cancer is diagnosed and treated. We also include information about support services.

We cannot give advice about the best treatment for you. You need to discuss this with your doctors. However, this information may answer some of your questions and help you think about what to ask your treatment team (see page 57 for a question checklist).

This booklet does not need to be read from cover to cover – just read the parts that are useful to you. Some medical terms that may be unfamiliar are explained in the glossary (see page 58). You may like to pass this booklet to family and friends for their information.

How this booklet was developed – This information was developed with help from a range of health professionals and people affected by primary liver cancer. It is based on international clinical practice guidelines and an Australian consensus statement.¹⁻³



If you or your family have any questions or concerns, call **Cancer Council 13 11 20**. We can send you more information and connect you with support services in your area. You can also visit your local Cancer Council website (see back cover).

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Key to icons

Icons are used throughout this booklet to indicate:



More information



Alert



Personal story



Tips

Is this Cancer Council booklet helpful?

Please follow this QR code for a quick 3-minute survey, or call 13 11 20 to provide your feedback.



SCAN ME

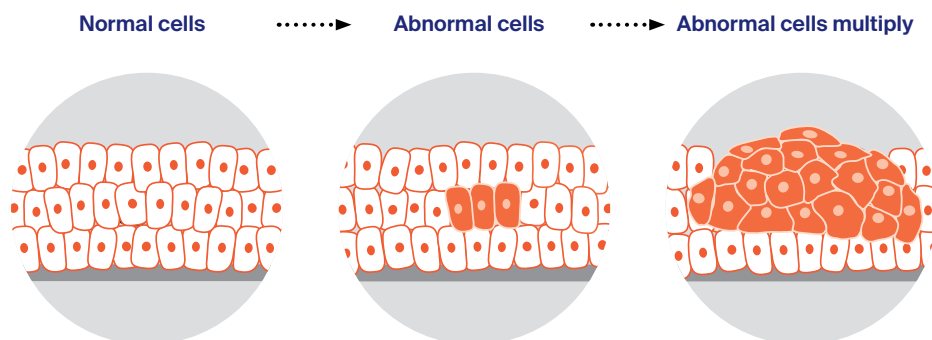
What is cancer?

Cancer is a disease of the cells. Cells are the body's basic building blocks - they make up tissues and organs. The body constantly makes new cells to help us grow, replace worn-out tissue and heal injuries.

Normally, cells multiply and die in an orderly way, so that each new cell replaces one lost. Sometimes, however, cells become abnormal and keep growing. These abnormal cells may turn into cancer.

In solid cancers, such as liver cancer, the abnormal cells form a mass or lump called a tumour. In some cancers, such as leukaemia, the abnormal cells build up in the blood.

How cancer starts

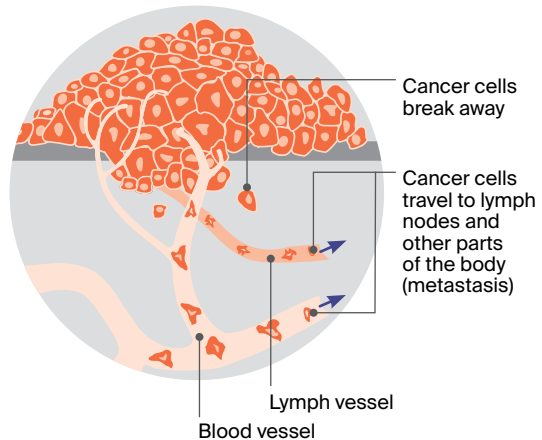
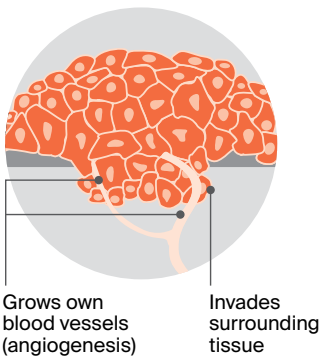


Not all tumours are cancer. Benign tumours tend to grow slowly and usually don't move into other parts of the body or turn into cancer. Cancerous tumours, also known as malignant tumours, have the potential to spread. They may invade nearby tissue, destroying normal cells. The cancer cells can break away and travel through the bloodstream or lymph vessels to other parts of the body.

The cancer that first develops is called the primary cancer. It is considered localised cancer if it has not spread to other parts of the body. If the primary cancer cells grow and form another tumour at a new site, it is called a secondary cancer or metastasis. A metastasis keeps the name of the original cancer. For example, liver cancer that has spread to the lungs is called metastatic liver cancer, even though the main symptoms may be coming from the lungs.

How cancer spreads

Malignant cancer



The liver

The largest organ inside the body, the liver is about the size of a football. It is part of the digestive system, working with the gall bladder and pancreas to help break down food and turn it into energy.

The liver has many important jobs, including:

- storing sugars and fats, so they can be used for energy
- producing bile to help dissolve fat so it can be easily digested
- making proteins to help blood clot and to balance fluid in the body
- breaking down harmful substances, such as drugs and alcohol.

The liver is found on the right side of the abdomen (belly), sitting just above the stomach and under the rib cage (see diagram opposite). It is divided into two main sections – the right and left lobes.

How the liver works

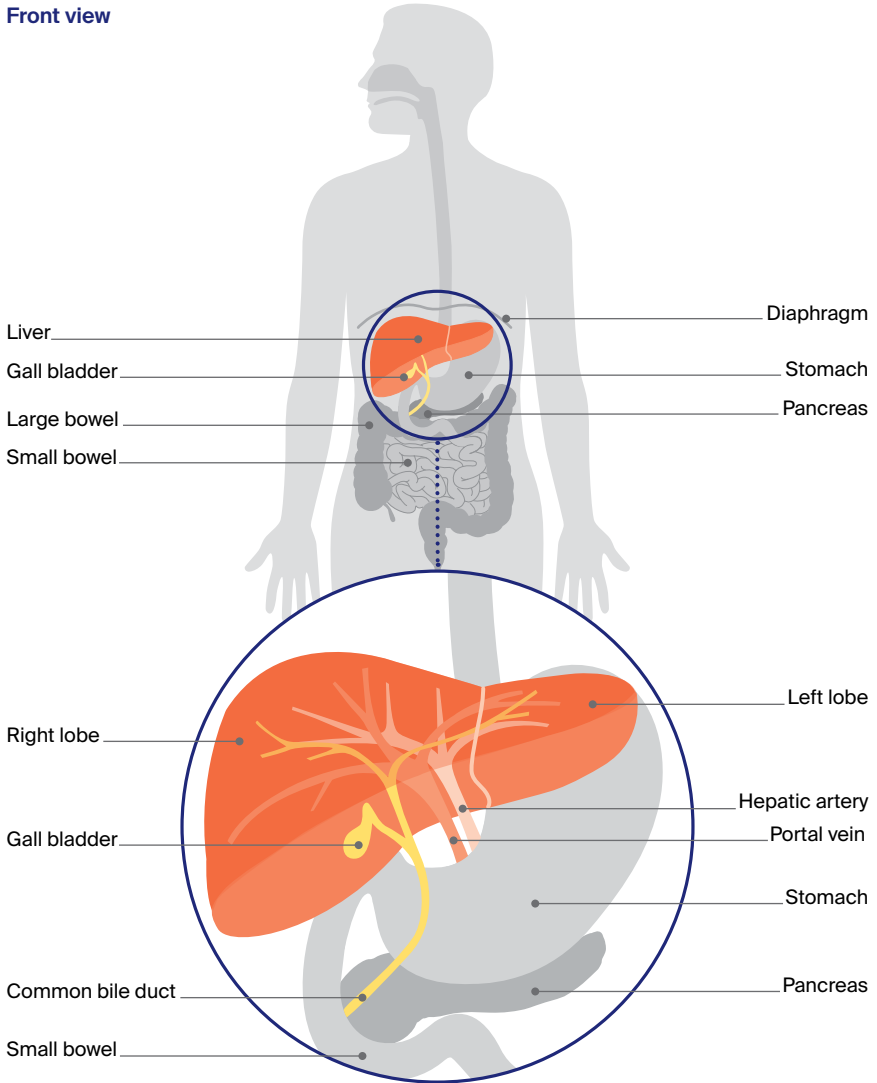
Blood flows into the liver from the hepatic artery and the portal vein. The hepatic artery carries blood from the heart. The portal vein carries blood from the digestive organs to the liver.

Bile is carried between the liver, the gall bladder and the first part of the small bowel (the duodenum) by a series of tubes called bile ducts. The common bile duct carries bile from the liver and the gall bladder to the bowel, where the bile helps to break down and absorb fats and other nutrients from food.

The liver can continue to work when only a small part is healthy. A healthy liver may be able to repair itself if it is injured or part of it is surgically removed during cancer treatment.

The digestive system

Front view



Key questions

Q: What is primary liver cancer?

A: Primary liver cancer is a malignant (cancerous) tumour that starts in the liver. The most common type of primary liver cancer in adults is hepatocellular carcinoma (HCC). HCC starts in the hepatocytes, the main type of liver cell. This booklet is only about HCC.

Less common types of primary liver cancer include:

- **cholangiocarcinoma or bile duct cancer** – starts in the bile ducts (see opposite page)
- **angiosarcoma and hemangiosarcoma** – rare types of liver cancer that start in the blood vessels
- **hepatoblastoma** – a rare type of liver cancer that affects only young children.

Cancers in the liver can be either a primary or secondary cancer. The two types of cancer are different. Secondary liver cancer is cancer that has started in another part of the body and spread to the liver. It is more common than primary liver cancer in Australia. If you are unsure if you have primary or secondary liver cancer, check with your doctor.

- ▶ See our fact sheet on *Understanding Secondary Liver Cancer*.

Q: How common is liver cancer?

A: In Australia, more than 3000 people are diagnosed with primary liver cancer each year, with almost three times more men than women affected.⁴ The rate of primary liver cancer has almost doubled since 2002, which is possibly due to increasing rates of

obesity, type 2 diabetes, hepatitis B and C infections, drinking too much alcohol, and an ageing population. About 80% of cases occur in people aged 60 and over.

Q: What are the symptoms?

A: Liver cancer often doesn't cause any symptoms in the early stages, and cancer that is diagnosed and treated before symptoms appear often has very good outcomes.

As the cancer grows or spreads, it may cause symptoms such as:

- weakness and tiredness (fatigue)
- pain in the abdomen (belly) or below the right shoulder blade
- a hard lump on the right side of the abdomen
- appetite loss, feeling sick (nausea), or unexplained weight loss
- yellowing of the skin and eyes (jaundice)
- dark urine (wee) and pale faeces (poo)
- itchy skin
- a swollen abdomen caused by fluid build-up (ascites).

Bile duct cancer (cholangiocarcinoma)

This uncommon form of primary liver cancer accounts for about 10–15% of all liver cancers worldwide. Bile duct cancer (cholangiocarcinoma) starts in the cells lining the ducts that carry bile between the liver, gall bladder and bowel. Most risk factors are similar to those of HCC

(see page 10), but exposure to certain chemicals in the print industry may also increase the risk of developing bile duct cancer.

► See our *Understanding Gall Bladder Cancer* fact sheet, which covers both gall bladder and bile duct cancer.

Q: What are the risk factors?

A: Primary liver cancer (hepatocellular carcinoma or HCC) most often develops in people with underlying liver disease, usually cirrhosis. In cirrhosis, healthy liver cells are replaced by scar tissue, and benign nodules (non-cancerous lumps) form throughout the liver. As this gets worse (advanced cirrhosis), the liver stops working properly.

Cirrhosis may be caused by: long-term (chronic) infection with hepatitis B or C virus (see opposite page); drinking too much alcohol; metabolic-associated fatty liver disease (MAFLD) as a result of obesity and/or type 2 diabetes; having too much iron in the bloodstream (haemochromatosis); or certain autoimmune conditions (e.g. primary biliary cholangitis).

A small but increasing number of people are developing liver cancer without cirrhosis. This may occur in those with long-term hepatitis B infection, or with liver disease related to obesity or type 2 diabetes.

Other risk factors for liver cancer are smoking tobacco or having a family history of HCC. Aboriginal and Torres Strait Islander peoples and migrants from countries with higher rates of hepatitis B infection (e.g. countries in the Asia-Pacific region and Sub-Saharan Africa) are also at greater risk of developing primary liver cancer.

The more risk factors a person has, the greater the chance of developing liver cancer.



For an overview of what to expect at every stage of your cancer care, visit cancer.org.au/cancercareguides/liver-cancer. This is a short guide to what is recommended, from diagnosis to treatment and beyond.

The link between hepatitis and liver cancer

Worldwide, up to 8 in 10 cases of liver cancer (HCC) can be linked to infection with the hepatitis B or C virus (viral hepatitis). This is changing as vaccinations and effective treatments for viral hepatitis are helping to reduce the rates of hepatitis-related liver cancer.

How hepatitis spreads

Hepatitis B and C spread through contact with infected blood, semen or other body fluids.

The most common way hepatitis B spreads is from an infected mother to a baby during birth. Hepatitis B can also be transmitted during unprotected sex with an infected partner, or by sharing personal items, such as razors or needles, with an infected person.

Hepatitis C is usually transmitted through the sharing of needles during illicit drug use, tattooing, sharing personal items, or contaminated medical equipment.

Viral hepatitis infects the liver cells (hepatocytes). When the body's immune system attacks the virus, the liver becomes inflamed. Infection that lasts for more than

six months may lead to liver damage (cirrhosis), which increases the risk of primary liver cancer. Importantly, people with cirrhosis should have long-term monitoring for liver cancer.

Preventing hepatitis

All babies in Australia are offered the hepatitis B vaccine at birth. To further prevent the spread of hepatitis B, at-risk people should also be vaccinated. This includes: Aboriginal and Torres Strait Islander peoples; people from countries with higher rates of hepatitis B; people living with someone with hepatitis; people who are immunocompromised; and health care workers.

If you already have hepatitis B, vaccination won't be helpful, but you will usually have regular tests to ensure you don't develop cancer or other liver problems. If you also have signs of liver damage, you may be offered antiviral medicines to help prevent further damage.

There is no vaccine for hepatitis C infection, but effective medicines are available and the virus can often be cured. While this treatment can lower the risk of primary liver cancer, it does not eliminate it.

Q: Which health professionals will I see?

A: Your general practitioner (GP) will arrange the first tests to assess your symptoms or to follow up abnormal results from ultrasound or blood tests that have been done to check for liver cancer. If these tests show that you have liver cancer – or there is concern about possible cancer – you will usually be referred to a specialist. This is likely to be a hepatobiliary surgeon, gastroenterologist or hepatologist. The specialist will arrange further tests.

Health professionals you may see

hepatobiliary surgeon	operates on the liver, gall bladder, pancreas and surrounding organs
gastroenterologist	diagnoses and treats disorders of the digestive system, including liver cancer; may treat liver cancer with drug therapies
hepatologist	a gastroenterologist specialising in liver disease
interventional radiologist	analyses x-rays and scans, may also perform a biopsy under ultrasound or CT and deliver some treatments
medical oncologist	treats cancer with drug therapies such as chemotherapy, targeted therapy and immunotherapy (systemic treatment)
radiation oncologist	treats cancer by prescribing and overseeing a course of radiation therapy
cancer care coordinator	coordinates your care, liaises with other members of the MDT and supports you and your family throughout treatment; care may also be coordinated by a clinical nurse consultant (CNC) or clinical nurse specialist (CNS)

If liver cancer is diagnosed, the specialist will consider treatment options. Often these will be discussed with other health professionals at what is known as a multidisciplinary team (MDT) meeting.

During and after treatment, you will see a range of health professionals who specialise in different aspects of your care. Primary liver cancer is challenging to treat and it is recommended that you are treated in a specialist treatment centre if possible.

nurse, hepatology nurse	administer drugs and provide care, information and support; a hepatology nurse specialises in liver cancer
occupational therapist	assists in adapting your living and working environment to help you resume usual activities after treatment
physiotherapist, exercise physiologist	help restore movement and mobility, and improve fitness and wellbeing
social worker	links you to support services and helps you with emotional, practical and financial issues
psychiatrist, counsellor, psychologist	help you manage your emotional response to diagnosis and treatment
dietitian	helps with nutrition concerns and recommends changes to diet during treatment and recovery
palliative care team	works closely with your GP and cancer team to help control symptoms and maintain quality of life; includes palliative care specialists and nurses, as well as other health professionals



Diagnosis

Liver cancer may be diagnosed using several tests. These include blood tests and imaging scans. It is becoming more common for a tissue sample to also be tested. This is called a biopsy.

Blood tests

Blood tests alone cannot diagnose liver cancer, but they can help doctors work out what type of liver cancer may be present and how well the liver is working. Blood tests can also provide information on the type of liver disease that may be causing cirrhosis. Samples of your blood may be sent for the following tests.

Liver function tests (LFTs) – These tests measure the levels of several substances that show how well your liver is working. You may have liver function tests done before, during and after treatment.

Blood clotting tests – These check if the liver is making proteins that help the blood to clot. Low levels of these proteins increase your risk of bleeding.

Hepatitis and other liver tests – These check for hepatitis B and C, which can lead to liver cancer (see page 11). Also, tests may be done to check for other possible causes of liver disease, such as too much iron in the bloodstream (haemochromatosis) or autoimmune hepatitis (when the body's own immune system attacks the liver).

Tumour markers – Some blood tests look for proteins produced by cancer cells. These proteins are called tumour markers.

The most common tumour marker for primary liver cancer is called alpha-fetoprotein (AFP). It may be higher in many, but not all, cases of primary liver cancer.

The AFP level may also be raised in people with conditions other than cancer, such as pregnancy, hepatitis and jaundice.

Imaging scans

Tests that take pictures of the inside of the body are known as imaging scans. An ultrasound scan is usually the imaging scan first used to look for liver cancer and to monitor people with cirrhosis.

An ultrasound scan alone cannot confirm a diagnosis of liver cancer, so you will also have one or more other scans. You may have some imaging scans more than once during diagnosis and again during treatment.

Ultrasound – An ultrasound scan is used to show if there is a tumour in the liver and how large it is. You will be asked not to eat or drink (fast) for about four hours before the ultrasound.

You will be asked to lie on your back for the scan and a gel will be spread onto your abdomen (belly). A small device called a transducer will be moved across the area. The transducer creates soundwaves that echo when they meet something solid, such as an organ or tumour. A computer turns these echoes into pictures.

An ultrasound is painless and usually takes only 15–20 minutes. If a solid lump is found, you will need other scans to show whether the lump is cancer. It is common to find non-cancerous (benign) lumps in the liver during an ultrasound.



Before having scans, tell the doctor if you have any allergies or have had a reaction to contrast during previous scans. You should also let them know if you have diabetes or kidney disease, or are pregnant or breastfeeding.

CT scan – A CT (computerised tomography) scan uses x-ray beams to take detailed, cross-sectional pictures of the inside of your body. It helps show the features of the tumour in the liver. It may also show if the cancer has spread beyond the liver.

During the scan, a liquid dye (called contrast) is injected into one of your veins. This helps ensure that anything unusual can be seen more clearly. The dye may make you feel flushed and cause some discomfort in your abdomen. These reactions usually go away in a few minutes, but tell the team if you feel unwell.

Some people have an allergic reaction to the dye. They may need to take medicine before the scan to prevent such a reaction or avoid CT scans with dye altogether. If you have had an allergic reaction to dye in the past, tell the radiology practice before your appointment.

The CT scanner is large and round like a doughnut. You will need to lie still on a table while the scanner moves around you. It can take 10–30 minutes to get ready for the CT scan, but the scan itself takes only a few minutes and is painless.

MRI scan – An MRI (magnetic resonance imaging) scan uses a powerful magnet and radio waves to create detailed cross-sectional pictures of the liver and nearby organs. An MRI is used to show the size of the tumour and whether it is affecting the main blood vessels and bile ducts around the liver. This scan is particularly helpful for diagnosing small tumours.

During the scan, you will be injected with a dye (called contrast) that highlights the organs in your body. You will then be asked to lie on an examination table that slides completely into a large metal tube that is open at both ends.

The MRI scanner is noisy and narrow, and this can make some people feel anxious or uncomfortable (claustrophobic). If you think you may become distressed, mention this beforehand to your doctor or nurse. You may be given a mild sedative to help you relax, and you will usually be offered headphones or earplugs. A liver MRI scan may take up to 30 minutes.

Bone scan – If a liver transplant (see pages 27–28) is a potential treatment and/or you have pain in the bones, you may need a bone scan to be sure the cancer has not spread (metastasised) to the bones.

Tissue sampling (biopsy)

A biopsy is when doctors remove a sample of cells or tissue from the affected area, and a pathologist examines the sample under a microscope to see if it contains cancer cells.

A biopsy is not always needed for diagnosis or when surgery is planned. If the diagnosis is not clear after the imaging scans, a biopsy may be useful. In the future, a biopsy may also provide information about the best treatment for each person (personalised medicine).

The liver has many blood vessels and there can be a risk of bleeding with a biopsy. Before a biopsy, your blood may be tested to check if it clots normally. If you are taking blood-thinning medicines, ask your doctor if you need to stop taking them before and after the biopsy.

The sample of cells is usually collected with a core biopsy. Before the procedure, you will be given a local anaesthetic to numb the area, so you will still be awake but won't feel pain.

The doctor will then pass a needle through the skin of the abdomen to remove a sample of tissue from the tumour. An ultrasound or CT scan helps the doctor guide the needle to the right spot. You may need to stay in hospital for a few hours or overnight if there is a high risk of bleeding.

Staging liver cancer

The stage of a cancer describes how large it is, where it is and whether it has spread in the body. Knowing the stage of a liver cancer helps doctors plan the best treatment for you. Primary liver cancer is staged using a method called the Barcelona Clinic Liver Cancer (BCLC) staging system. The system has 5 stages: 0 (very early); A (early); B (intermediate); C (advanced); D (end-stage).

To work out a cancer's stage, your doctor will consider:

- the size of the tumour
- the number of tumours
- whether the cancer has spread to blood vessels, lymph nodes or other organs
- how well you are functioning in daily life and how active you are
- how well the liver is working (using a Child-Pugh score).

The Child-Pugh score records how well the liver is working. In this system, liver function is ranked as: A (some damage but is working normally); B (moderate damage, affecting how well the liver is working); or C (very damaged and not working well). A severely damaged liver may not be able to cope with some types of cancer treatment.

The doctor may also check for portal hypertension. Cirrhosis can sometimes increase the blood pressure in the portal vein, which carries blood from the digestive organs to the liver. This can affect how the cancer can be treated (e.g. surgery may not be an option in people with portal hypertension).

Prognosis

Prognosis means the expected outcome of a disease. You may wish to discuss your prognosis with your doctor, but it is not possible for anyone to predict the exact course of a disease. To work out your prognosis, your doctor will consider:

- test results
- the type of liver cancer, its stage and how fast it is growing
- whether you have cirrhosis and how well the liver is working
- how well you respond to treatment
- other factors such as your age, fitness and overall health.

Discussing your prognosis and thinking about the future can be challenging and stressful. It is important to know that although the statistics for primary liver cancer can be frightening, they are based on an average of many cases and may not apply to your situation. Talk to your doctor about how to interpret any statistics that you come across.

The prognosis for liver cancer tends to be better when the cancer is still in the early stages, but liver cancer is often found later. Surgery to remove the cancer (liver resection) or a liver transplant may be an option for some people with primary liver cancer. Other treatments for liver cancer can significantly improve survival and can relieve symptoms to improve quality of life.

Key points about diagnosing primary liver cancer

- Blood tests**
- Several blood tests are used to help diagnose and stage primary liver cancer, including liver function tests (LFTs), blood clotting tests and hepatitis tests.
 - A blood test will also show if your blood contains a protein produced by liver cancer cells called alpha-fetoprotein (AFP). This is called a tumour marker.
 - Blood tests alone are not enough to diagnose primary liver cancer, but they can help to show how well the liver is working.
-

- Imaging scans**
- An ultrasound can show if there is a tumour in the liver and how large it is. If a tumour is found, other imaging scans will be needed to show if it is cancer.
 - A CT (computerised tomography) scan uses x-ray beams to create more detailed pictures of the inside of your body. It may show if a tumour is cancerous, and if the cancer has spread beyond the liver.
 - An MRI (magnetic resonance imaging) scan uses a magnet and radio waves to create detailed pictures of the liver and nearby organs. This scan can show the size of the tumour and whether it is affecting the main blood vessels around the liver.
 - A bone scan may be needed to check if the liver cancer has spread to the bones.
-

Biopsy Liver tissue samples may be taken (a biopsy) to help with diagnosis.

Staging To work out the stage of the liver cancer, your doctor will consider how well the liver is working, the size and number of tumours, as well as your general health. This is called the Barcelona Clinic Liver Cancer (BCLC) staging system.



Making treatment decisions

Sometimes it is difficult to decide on the type of treatment to have. You may feel that everything is happening too fast, or you might be anxious to get started.

Check with your specialist how soon treatment should begin, as it may not affect the success of the treatment to wait a short time. Ask them to explain the options, and take what time you can before making a decision.

Know your options – Understanding the disease, the available treatments, possible side effects and any extra costs can help you weigh up the options and make a well-informed decision. Check if the specialist is part of a multidisciplinary team (see page 13) and if the treatment centre is the most appropriate one for you – you may be able to have treatment closer to home, or it might be worth travelling to a centre that specialises in a particular treatment.

Record the details – When your doctor first says you have cancer, you may not remember everything you are told. Taking notes can help. If you would like to record the discussion, ask your doctor first. It is a good idea to have a family member or friend go with you to appointments to join in the discussion, write notes or simply listen.

Ask questions – If you are confused or want to check anything, it is important to ask your specialist questions. Try to prepare a list before appointments (see page 57 for suggestions). If you have a lot of questions, you could talk to a cancer care coordinator or nurse.

Consider a second opinion – You may want to get a second opinion from another specialist to confirm or clarify your specialist's recommendations or reassure you that you have explored all of your options. Specialists are used to people doing this. Your GP or specialist can refer you to another specialist and send your initial results to that person. You can get a second opinion even if you have started treatment or still want to be treated by your first doctor. You might decide you would prefer to be treated by the second specialist.

It's your decision – Adults have the right to accept or refuse any treatment that they are offered. For example, some people with advanced cancer choose treatment that has significant side effects even if it gives only a small benefit for a short period of time. Others decide to focus their treatment on quality of life. You may want to discuss your decision with the treatment team, GP, family and friends.

► See our *Cancer Care and Your Rights* booklet.

Should I join a clinical trial?

Your doctor or nurse may suggest you take part in a clinical trial. Doctors run clinical trials to test new or modified treatments and ways of diagnosing disease to see if they are better than current methods. For example, if you join a randomised trial for a new treatment, you will be chosen at random to receive either the best existing treatment or the modified new treatment. Over the years, trials have improved treatments and

led to better outcomes for people diagnosed with cancer.

You may find it helpful to talk to your specialist, clinical trials nurse or GP, or to get a second opinion. If you decide to take part in a clinical trial, you can withdraw at any time. For more information, visit australiancancertrials.gov.au.

► See our *Understanding Clinical Trials and Research* booklet.

Treatment

There are many different types of treatment for hepatocellular carcinoma (HCC), which is the most common type of primary liver cancer. The treatment recommended will depend on a range of factors, including:

- the size of the tumour
- how far it has spread within the liver and the body
- whether you have cirrhosis
- if any major blood vessels are involved
- your age and your general health.

An MDT (see page 13) may meet to discuss the best treatment options for you. Ask your doctor if your case has been discussed by an MDT.

Treatments for HCC that affects only the liver include:

- **surgery** – liver resection or liver transplant
- **tumour ablation** – heat or alcohol is used to destroy the tumour
- **radiation therapy** – stereotactic body radiation therapy (SBRT), also known as stereotactic ablative body radiation therapy (SABR), or selective internal radiation therapy (SIRT)
- **transarterial chemoembolisation (TACE)** – chemotherapy drugs are delivered directly to the tumour via its blood supply.

If the cancer is advanced or has spread beyond the liver, you may be offered drug therapies such as immunotherapy or targeted therapy. Sometimes, if the liver is too damaged, you may be offered palliative treatment (see page 40) to manage symptoms and improve your quality of life.

Surgery

Liver surgery aims to remove all the cancer from the body. This may be done by removing the part of the liver affected by cancer (known as a liver resection or partial hepatectomy) or by removing the whole liver and replacing it with a liver from a donor (liver transplant). Your surgeon will talk to you about the most appropriate surgery for you, as well as the risks and any possible complications.

Informed consent – There are risks associated with any type of surgery. A surgeon needs your agreement (consent) before performing the operation. Receiving relevant information about the benefits and risks of surgery before agreeing to it is called informed consent.

Liver resection

The aim of a liver resection is to remove all cancer from the liver, as well as a margin of healthy tissue. Liver resection is usually performed in a specialist treatment centre.

A liver resection is suitable for only a small number of people with liver cancer. The liver needs to repair itself after the surgery, so a resection is only an option when the liver is working well.

People with no or early cirrhosis may be considered for surgery, but it is unlikely that people with more advanced cirrhosis will be offered surgery. Surgery is also not suitable for people with ascites (see page 46) or when the cancer has spread to major blood vessels.

Types of liver resection – The surgeon will consider the size and position of the tumour, as well as the health of the liver, to work out how much of the liver can be safely removed. The liver resection may be called a right or left hepatectomy (removes the right or left



Before your treatment begins, your treatment team may suggest that you exercise, eat a healthy diet, or speak to a counsellor about how you feel. If you smoke, you will be encouraged to stop. Research shows that quitting smoking before surgery reduces the chance of complications. Preparing for treatment in this way – called “prehabilitation” – may help your recovery.

part of the liver) or a segmentectomy (removes a small section of the liver). In some cases, the gall bladder may also be removed, along with part of the muscle that separates the chest from the abdomen (the diaphragm).

Portal vein embolisation (PVE) – Sometimes, the surgeon needs to remove so much of the liver that the remaining portion may not be large enough to recover. In this case, you may have a portal vein embolisation (PVE) about 4–8 weeks before the liver resection (see diagram, page 26).

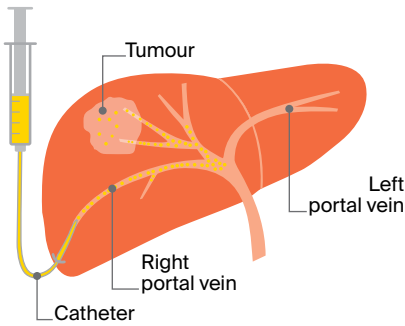
A PVE is performed by an interventional radiologist and is normally done under local anaesthetic.

How a liver resection is done – If you have a liver resection, it will be carried out under a general anaesthetic. There are two ways to perform the surgery:

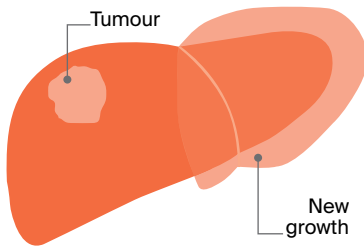
- in open surgery, the surgeon makes a large cut in the upper abdomen under the rib cage. This is the most common type of surgery.
- in keyhole (laparoscopic) surgery, the surgeon makes a few small cuts in the abdomen, then inserts a thin instrument with a light and camera (laparoscope) into one of the cuts. Using images from the camera as a guide, the surgeon inserts tools into the other cuts to remove the cancerous tissue.

How a PVE is done

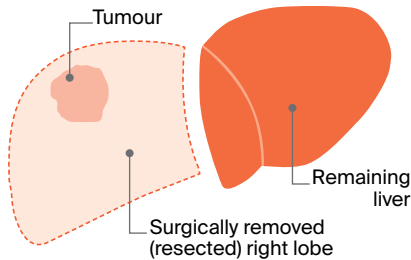
In some cases, you may need a portal vein embolisation (PVE) before a liver resection. A PVE blocks the branch of the portal vein that carries blood to the part of the liver that is going to be surgically removed. Blocking the blood supply allows the other part of the liver to grow bigger.



1. The interventional radiologist inserts a tube (catheter) through the skin. Using ultrasound as a guide, a dye is injected to identify the portal vein. Then the targeted branch will be blocked with tiny plastic beads, soft gelatine sponges or metal coils.



2. Blood is redirected to the part of the liver that will be kept to help it grow.



3. After 4–8 weeks, you will have a CT scan to measure the size of your liver. If the liver has grown enough to safely do a liver resection, the surgeon will remove the part of the liver with the tumour.



What type of surgery will I have? – People who have laparoscopic surgery usually have a shorter stay in hospital, less pain and a faster recovery time. However, laparoscopic surgery is not suitable for everyone with primary liver cancer and it is not available in all hospitals. Both open surgery and laparoscopic surgery are major operations – talk to your surgeon about the best option for you.

What to expect after surgery – The portion of the liver that remains after the resection will start to grow, even if up to two-thirds of the liver has been removed. It will usually regrow to its normal size within a few months, although its shape may be slightly changed. After surgery:

- Bleeding is a risk because a lot of blood passes through the liver. You will be monitored for signs of bleeding and infection.
 - Some people experience jaundice (yellowing of the skin and whites of the eyes). This is usually temporary and improves as the liver grows back (see page 42).
 - Most people will need a high level of care. You will spend 5–10 days in hospital after a liver resection and it is common to spend some time in the high dependency or intensive care unit before moving to a standard room.
- ▶ See our *Understanding Surgery* booklet.

Liver transplant

A liver transplant can be an effective treatment for some people with primary liver cancer. It involves removing the whole liver and replacing it with a healthy liver from another person (a donor). However, liver transplants are suitable for only a small number of people. Those with a single tumour or several small tumours may be able to have a transplant. A liver transplant may also be considered if other therapies such as TACE (see pages 34–36) can shrink the tumour first. This is called downstaging.

To be considered for a liver transplant, you also need to be reasonably fit, not smoke or take illegal drugs, and have stopped drinking alcohol for at least six months.

Liver transplants are not possible when the cancer has spread (metastasised) to other organs or to major blood vessels.

Currently, all liver transplants in Australia are performed in public hospitals and there is no cost for in-hospital services. You will usually have to pay for any medicines you continue to take once you leave the hospital after the transplant.

Waiting for a liver transplant – Donor livers are scarce and waiting for a suitable liver may take many months or even several years. During this time, the cancer may continue to grow. As a result, most people have tumour ablation (see opposite page) or TACE (see pages 34–36) to control the cancer while they wait for a donor liver to become available.

Unfortunately, in some people the cancer progresses despite having tumour ablation or TACE, and a liver transplant will no longer be possible. If this happens, you will be taken off the liver transplant waiting list and your doctor will discuss other treatment options.

What to expect after a transplant – If you have a liver transplant, you will spend up to three weeks in hospital. It may take 3–6 months to recover and it will probably take time to regain your energy.

You will be given medicines called immunosuppressants to stop your body rejecting the new liver. These drugs need to be taken for the rest of your life.

Tumour ablation

For tumours smaller than 3 cm, you may be offered tumour ablation. This destroys the tumour without removing it and may be the best option if you cannot have surgery or are waiting for a transplant.

Ablation can be done in different ways depending on the size, location and shape of the tumour. Thermal ablation and alcohol injection are the most common methods used for liver cancer. Cryotherapy, which uses freezing to destroy the tumour, is rarely used.

Thermal ablation – This ablation method uses heat to destroy a tumour. The heat may come from radio waves (radiofrequency ablation or RFA) or microwaves (microwave ablation or MWA). Using an ultrasound or CT scan as a guide, the doctor inserts a fine needle through the abdomen into the liver tumour. The needle sends out radio waves or microwaves that produce heat and destroy the cancer cells.

Thermal ablation is usually done under general anaesthetic in the x-ray department or the operating theatre. Treatment may take 1-2 hours. Some people may stay overnight in hospital, but many can leave the hospital after treatment. Side effects may include pain, nausea or fever, but these can be managed with medicines.

Alcohol injection – This ablation method involves injecting pure alcohol (ethanol) into the tumour. This procedure – called percutaneous ethanol injection or PEI – isn't available at all hospitals but may be used if other forms of ablation aren't possible. For this procedure, a needle is passed into the tumour under local anaesthetic, using an ultrasound as a guide. You may need more than one injection over several sessions. Side effects are rare but may include pain or fever. These can be managed with medicines.

Radiation therapy

Primary liver cancer is sensitive to radiation but so are healthy liver cells. Two specialised techniques can deliver radiation directly to the tumour while limiting the damage to the healthy part of the liver. These are called stereotactic body radiation therapy (SBRT) and selective internal radiation therapy (SIRT). SBRT may be suitable for people with early-stage cancer, while SIRT may be offered in more advanced cases.

Conventional external beam radiation therapy (EBRT) is also occasionally used as a palliative treatment to help manage symptoms (see page 40). For example, short courses of EBRT can help to control pain caused by liver cancer that has spread to the bones.

Stereotactic body radiation therapy (SBRT)

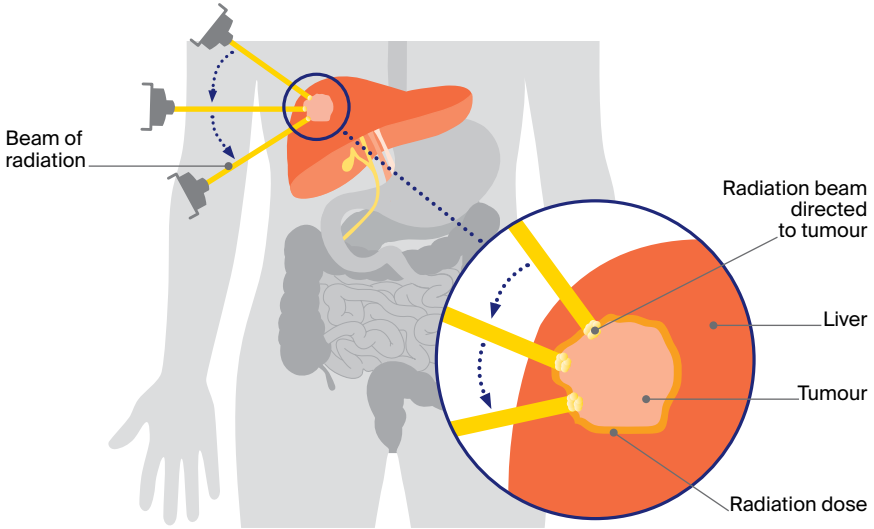
This type of therapy may be called stereotactic body radiation therapy (SBRT) or stereotactic ablative body radiation therapy (SABR). It is a type of EBRT. The machine precisely targets beams of radiation from many different angles onto the tumour.

SBRT is prescribed by a radiation oncologist and delivered in a radiation therapy department. This method allows a high dose of radiation to be delivered to the tumour while surrounding healthy tissue is protected from the effects of radiation. SBRT requires fewer treatment sessions than conventional radiation therapy. People may need only 3–8 sessions over one or two weeks.

This treatment may be offered to people with tumours that can't be removed with surgery or treated with tumour ablation or TACE. SBRT may also be used to shrink tumours while people are waiting for a liver transplant.

How SBRT is done

Stereotactic body radiation therapy (SBRT) precisely targets beams of high-dose radiation from different angles onto the tumour.



Before this treatment, you will have a CT scan and maybe an MRI scan as well. These scans help make an individual plan for your treatment. You may also need a short procedure to insert small metal markers (called fiducial markers) next to the tumour. These markers allow the radiation oncologist to monitor the exact position of the tumour during the treatment. They are usually made of gold and are about the size of a grain of rice. A needle is used to put in the markers during the CT scan. Not all people will need to have these markers inserted.

During treatment, you will be asked to lie on a treatment table while a machine delivers the targeted beams to the tumour. It is important to

lie very still during SBRT treatment. Simple breathing techniques – like holding your breath for 10–15 seconds – can help reduce movement during the procedure. Your treatment team will talk to you about this. SBRT itself is painless, and you can usually go home after the treatment. You will not be radioactive after SBRT.

Selective internal radiation therapy (SIRT)

Selective internal radiation therapy (SIRT) is a different type of radiation therapy. Sometimes called radioembolisation, SIRT combines embolisation (which blocks blood supply to the tumour) with internal radiation, where the radiation source is placed inside the liver.

In SIRT, the radiation is delivered through the blood vessels to the tumour using tiny radioactive beads, which are made of resin or glass. The procedure may be offered for primary liver cancer when the tumours can't be removed with surgery or to shrink tumours before a liver resection or a transplant.

SIRT is performed by an interventional radiologist, supported by a nuclear medicine physician, in a radiology department. One to two weeks before the procedure, you will have a work-up day to ensure the procedure is appropriate for you.

Work-up day – Several tests will be done on this day, including blood tests to check kidney function and blood clotting, and an angiogram (an x-ray of the blood vessels).

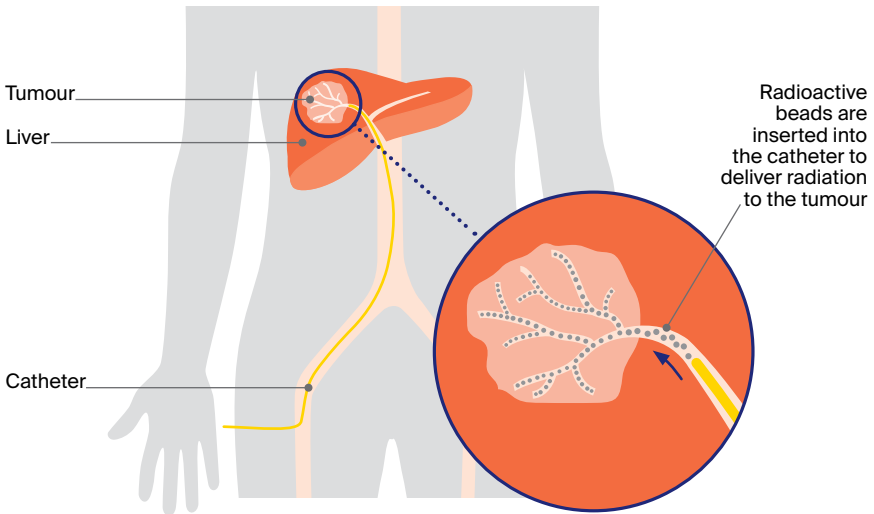
Before the angiogram, you will have a local or general anaesthetic. The interventional radiologist will then make a small cut in the groin area and insert a thin plastic tube (called a catheter) into the artery that feeds the liver (hepatic artery). A small amount of dye (contrast) will be

passed through the catheter into the bloodstream. On an x-ray, the dye provides a detailed map of the blood supply to the liver, which varies from person to person. The doctor may also block some small blood vessels. This helps to stop the radioactive beads travelling beyond the liver to other parts of the body when you have the SIRT treatment.

Next, a substance called a radiotracer will be injected into the catheter and you will have another scan. This scan shows where the radioactive beads will go on the day of treatment. It will also check if any beads are likely to travel to the lungs. This step helps the doctor work out if it is safe to go ahead with the treatment.

How SIRT is done

Selective internal radiation therapy (SIRT) combines embolisation with internal radiation therapy (see next page for a description of the treatment day).



Treatment day – On the day of treatment, you will have another angiogram. The interventional radiologist will make a cut in the groin area and pass a catheter through to the hepatic artery.

The radioactive beads will be inserted through the catheter into the hepatic artery. These beads can then deliver radiation directly to the tumour.

The procedure takes about an hour. You will be monitored after the procedure, and recover in hospital overnight.

After treatment – You may experience flu-like symptoms, nausea and pain, which can be treated with medicines. You can usually go home within 24 hours.

The radioactive beads will slowly release radiation into the tumour over the next week or so. During this time, you may need to take some safety precautions such as avoiding close physical contact with children or pregnant women. You may also be advised to not share a bed or have sex in the first few days after treatment.

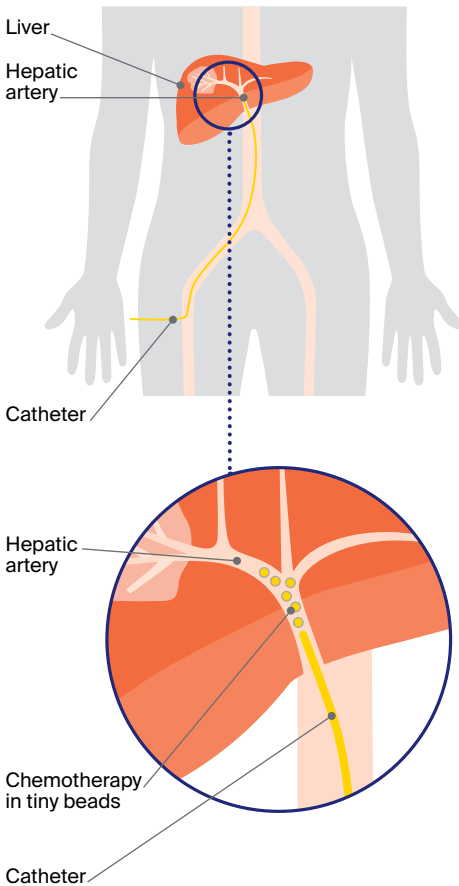
Transarterial chemoembolisation (TACE)

Liver tumours mostly get their blood supply from the hepatic artery. In transarterial chemoembolisation (TACE), chemotherapy is delivered directly to the tumour through this artery (see opposite page).

TACE is usually given to people who can't have surgery or ablation for primary liver cancer. The procedure may be used to shrink the cancer or stop it growing while people are waiting for a liver transplant or a major liver resection.

How TACE is done

Transarterial chemoembolisation (TACE) delivers chemotherapy directly to a tumour while blocking its blood supply (embolisation). It is done by an interventional radiologist.



- 1.** Before TACE, you will have a local anaesthetic and possibly a sedative to help you relax.
- 2.** The interventional radiologist will make a small cut in the groin, then pass a plastic tube called a catheter through the cut and into the hepatic artery.
- 3.** The chemotherapy drugs are injected into the liver through the catheter. The chemotherapy will either be mixed with an oily substance or loaded onto tiny plastic beads. The blood vessel feeding the tumour may also be blocked.
- 4.** After TACE, you will have to remain lying down for about 4 hours. You may also need to stay in hospital for a night or a few days.
- 5.** You will have a CT or MRI scan about 4–12 weeks after the procedure to see how well the treatment has worked.

Side effects of TACE – It is common to have a fever the day after the procedure, but this usually passes quickly. You may experience nausea and vomiting, or feel some pain, which can be controlled with medicines. Some people feel tired or have flu-like symptoms for up to a week after the procedure.

Drug therapies

Two types of drug therapy are available to treat primary liver cancer: immunotherapy and targeted therapy.

Drug therapies (sometimes called systemic therapies) can spread throughout the whole body to treat cancer cells wherever they may be, which can be helpful for cancer that has spread (metastatic cancer).

Immunotherapy

This is a type of drug treatment that helps the body's own immune system to fight cancer cells. Immunotherapy drugs known as checkpoint inhibitors block proteins that stop immune cells from recognising and destroying the cancer cells. Once the proteins are blocked, the immune cells can recognise and attack the cancer.

A checkpoint inhibitor called atezolizumab is an immunotherapy drug subsidised on the Pharmaceutical Benefits Scheme (PBS) to treat some types of primary liver cancer.



Drug treatment for advanced liver cancer is changing quickly and new treatments may become available in the near future. You may also be able to get new drugs through clinical trials (see page 22). Talk to your doctor about the latest developments and whether there are any suitable clinical trials for you.

Atezolizumab, which is given in combination with a targeted therapy drug called bevacizumab, is often the first drug treatment used for primary liver cancer.

Immunotherapy drugs are delivered by drip into a vein (intravenously), which may take 1-3 hours. Treatments are usually given every three weeks; your doctor will discuss with you how often and how many treatments will be needed.

“It helps to focus on what is happening now, what is actually known – not all the possibilities. One step at a time.” SAM

Side effects – Immunotherapy can have different side effects for different people. These mostly happen when the immune system becomes overstimulated and attacks organs such as the skin, bowel, liver or hormone-producing glands.

These immune-related side effects can happen when you are having treatment or in the weeks, months, or even years, afterwards. In rare cases, side effects can be the sign of serious complications, so even mild side effects should be reported to your doctor.

Immune-related side effects may need to be treated with drugs to help control the immune response (called immunosuppressive drugs), and the immunotherapy may need to be stopped.

If you are unable to manage the side effects of immunotherapy, your doctor may recommend switching to targeted therapy (see page 38).

When you start immunotherapy, you may be given an alert card so you can let all health professionals know that you are having this treatment. This ensures that you are given the best treatment if you develop side effects.

▶ See our *Understanding Immunotherapy* fact sheet.

Targeted therapy

This type of treatment targets specific features of cancer cells to stop the cancer growing and spreading. People who have advanced liver cancer and are unable to take immunotherapy may be offered targeted therapy drugs such as sorafenib or lenvatinib.

These drugs are both subsidised by the PBS for some types of primary liver cancer. They are given as tablets that you swallow. Your doctor will explain when to take them.

Side effects – The side effects of sorafenib and lenvatinib may include skin rash, diarrhoea, fatigue and high blood pressure. These side effects can usually be managed without having to completely stop treatment.

Your treatment team will monitor you while you are taking targeted therapy drugs. If you find the side effects of targeted therapy difficult to manage, your doctor may recommend switching to another drug.

Generally, targeted therapy is continued for as long as there is benefit. If liver cancer progresses despite treatment with sorafenib or lenvatinib, your doctor may talk to you about trying another targeted therapy drug.

▶ See our *Understanding Targeted Therapy* fact sheet or listen to our “New Cancer Treatments” podcast episode.



Ron's story

It was quite by accident that a cancer was picked up in my liver back in July 2021.

The tumour was found at a very early stage, but the diagnosis still came as a shock. I thought, "well, we had better get on top of this".

My case was handed to the multidisciplinary team at the hospital. They organised a TACE procedure for the following month.

I sailed through TACE. The procedure itself took only about 40 minutes, but I stayed in hospital overnight because I was quite groggy afterwards.

While I was hoping that we could nail the tumour with TACE, the procedure didn't go to plan. The location of the tumour made it difficult to reach with the chemotherapy drugs.

I wasn't too concerned, though, because I knew that there were back-up options. I just moved onto

the next phase. In November of the same year, I had another type of treatment called SBRT.

I had to learn special breathing techniques so that I could stay as still as possible during the procedure and for the CT scans beforehand.

The whole SBRT process was quick and seamless. I had treatments every second day, and it was all over within 10 days.

I have had negligible after effects and no complications whatsoever.

A follow-up MRI scan three months after the SBRT showed that the tumour has already shrunk. I will have another MRI six months after the treatment to check that it has been successful.

I would like to praise the whole health care team for the timely and professional care I have received. I have felt well informed at every stage of the treatment process.

Palliative treatment

If liver cancer is advanced when it is first diagnosed or returns after initial treatment, your doctor will discuss treatment options to help control the cancer's spread and relieve symptoms.

Palliative treatment helps to improve people's quality of life by managing the symptoms of cancer when a cure is not possible. It is best thought of as supportive care. Many people think that palliative treatment is for people at the end of their life, but it may help at any stage of advanced liver cancer. It is about living as long as possible in the most satisfying way you can.

Treatment may include radiation therapy; pain management; insertion of a stent in the bile duct to relieve jaundice (see page 42); or drainage of fluid (ascites, see page 46).

Palliative treatment is one aspect of palliative care, in which a team of health professionals aims to meet your physical, emotional, cultural, social and spiritual needs. The team also supports families and carers.

▶ See our *Understanding Palliative Care* and *Living with Advanced Cancer* booklets.

“I'd like people with advanced cancer to know that there are a myriad of services. You only have to ask; you are not alone.” PAT

Key points about treating primary liver cancer

Surgery

- Two types of surgery are used in treating liver cancer: liver resection and liver transplant.
- In a liver resection, the part of the liver with cancer is removed using surgery. This operation is suitable for only a small number of people.
- Before a liver resection, you may also have a procedure called a portal vein embolisation (PVE). A PVE redirects the blood supply to the healthy part of the liver, helping it to grow before surgery.
- A liver transplant may be considered in people with only one tumour, or several small tumours.
- A transplant replaces the liver with a healthy liver from another person (donor).
- Donor livers are scarce and waiting for a suitable liver may take many months or longer.

Other treatments

- Tumour ablation uses heat (thermal ablation) or alcohol injection (percutaneous ethanol injection) to destroy small tumours.
- Two specialised radiation therapy techniques may be used when surgery is not recommended or to shrink the tumour before surgery. These are called stereotactic body radiation therapy (SBRT) – also called stereotactic ablative body radiation therapy (SABR) – and selective internal radiation therapy (SIRT). External beam radiation therapy (EBRT) may also be used in advanced cancer.
- Transarterial chemoembolisation (TACE) blocks the tumour's blood supply and delivers high doses of chemotherapy directly into the tumour.
- Immunotherapy and targeted therapy are the two types of drug therapy used to treat primary liver cancer.

Palliative treatment

- Palliative treatment can help to relieve symptoms of advanced liver cancer.
-



Managing symptoms

Primary liver cancer can cause various symptoms, but there are ways to manage them. With advanced cancer, the palliative care team may be involved in managing symptoms.

Jaundice

One of the liver's jobs is to process bilirubin, a yellow pigment formed when red blood cells in the body break down. Normally, the bilirubin passes from the liver, through the bile duct to the bowel, and then out of the body in faeces (poo).

With liver cancer, bilirubin sometimes builds up in the blood. This can be because the cancer has blocked a bile duct, the liver is not working properly, or the liver has been replaced by widespread tumour. The build-up of bilirubin in the blood is known as jaundice. It can cause yellowing of the skin and whites of the eyes, pale faeces, dark urine and itchy skin.

This itching is often worse at night. It can be relieved to some degree by keeping your skin moisturised, and avoiding alcohol, spicy food, hot baths and direct sunlight. If the itching continues, your doctor may prescribe medicine, which can sometimes help.

When jaundice is caused by a blocked bile duct, it may be relieved by unblocking the duct with a small tube made of plastic or metal (a stent). Symptoms of jaundice usually go away 2–3 weeks after the stent is put in place. The earlier the stent is inserted, the less severe the symptoms. Stenting is not always recommended or possible in advanced cancer.

Pain

In some people, liver cancer can cause pain in the upper right area of the abdomen (belly) and, sometimes, in the right shoulder. If the cancer has spread outside the liver, pain may also occur in the ribs, back or pelvis.

Pain can be managed with different types of pain medicines. These may be mild, like paracetamol, or strong and opioid-based, like morphine, hydromorphone or fentanyl. Some pain medicines, such as ibuprofen and aspirin, may not be suitable for pain caused by liver cancer. Speak to your doctor about this.

Pain can also be managed with radiation therapy (to reduce the size of a liver tumour) or a nerve block (when an anaesthetic is injected into the nerve). You may also be referred to see a pain or palliative care specialist.



How to cope with pain

- Keep track of your pain in a symptom diary.
 - Allow a few days for your body to adjust to the dose of pain medicine and for any drowsiness to improve.
 - Let your doctor know if you have vivid dreams, nausea or other side effects after taking a strong pain medicine such as morphine. The doctor can adjust the dose or you can try other pain relief methods.
 - If you are taking an opioid-based drug like morphine, use a laxative to prevent or relieve constipation.
 - Take pain medicine as prescribed, even when you're not in pain. Managing pain may become more difficult if pain medicine is not taken regularly.
- ▶ See our *Understanding Cancer Pain* booklet.

Poor appetite and weight loss

Because the liver plays a key role in the digestive system (see pages 6–7), cirrhosis and cancer in the liver can affect how much you eat, and you may lose weight. Radiation therapy and other cancer treatments can also have an impact on appetite and weight, especially if you have side effects such as nausea and vomiting, mouth ulcers, and taste or smell changes.

Maintaining your weight can help your recovery, so it's important to eat and drink enough during and after treatment. Gentle physical activity, like a short walk around the block, can help to stimulate your appetite, and eating a variety of foods may boost how much you are able to eat.

Your doctor may suggest that you avoid salty foods as these can increase the risk of ascites (fluid build-up, see page 46). For more tips on staying well nourished, see the opposite page.

Fatigue

Many people with primary liver cancer experience fatigue. This is different to normal tiredness as it doesn't always go away with rest or sleep. The fatigue may be a side effect of treatment or caused by the cancer itself. Managing fatigue is an important part of cancer care.

- ▶ See our *Understanding Fatigue and Cancer* fact sheet and listen to our “Managing Cancer Fatigue” podcast episode.

“After treatment, a psychologist explained that it’s common to feel like you have had the rug pulled out from underneath you.” JOHN

How to stay well nourished

Eat foods you enjoy



Eat foods that you like, but also try eating different foods. Your taste and tolerance for some foods may have changed and may continue to change. Chew foods well and slowly to avoid becoming too full.

Drink fluids



Prevent dehydration by drinking fluids, such as water, between meals (e.g. 30–60 minutes before or after meals). Avoid filling up on fluids at mealtimes – unless it's a hearty soup – to ensure you have room for nourishing food.

Talk to a dietitian



Ask your dietitian what foods you can eat to increase your energy and protein intake.

Get help



Ask your family and friends to cook for you and offer you food throughout the day.

Snack during the day



Try eating 5–6 small meals rather than three large ones each day. Keep a selection of snacks handy (e.g. in your bag or car).

- ▶ See our *Nutrition for People Living with Cancer* booklet for more information and meal ideas.

Fluid build-up

Ascites is when fluid builds up in the abdomen. In people with cirrhosis, pressure can build up in the blood vessels inside the liver, which may force fluid to leak into the abdomen.

Ascites can also be caused by the cancer itself blocking lymph or blood vessels or producing extra fluid. The fluid build-up causes swelling and pressure in the abdomen. This can be uncomfortable and may make you feel breathless.

Initial treatment may include reducing salt intake in your diet and the use of diuretics (sometimes called water or fluid tablets) to reduce fluid in the body.

If needed, a procedure called paracentesis or ascitic tap can also provide relief. Your doctor will numb the skin on the abdomen with a local anaesthetic. A thin needle and plastic tube are then placed into the abdomen, and the tube is connected to a drainage bag outside your body. Sometimes, an ultrasound scan is used to guide this procedure. It will take a few hours for all the fluid to drain into the bag, and then the tube will be removed from your abdomen. Diuretics may be prescribed with paracentesis to slow down the build-up of fluid.

Confusion

In people with cirrhosis, toxic substances can sometimes build up in the blood and affect how your brain functions. Called hepatic encephalopathy, this can lead to confusion or disorientation and, in severe cases, coma. Carers need to look out for these symptoms as this condition can develop quickly. Hepatic encephalopathy can be controlled with medicines.

Key points about managing symptoms

Jaundice

- If the liver is not working properly or the bile ducts are blocked, a substance called bilirubin can build up in the blood. This is called jaundice.
- Jaundice can cause yellowing of the skin and whites of the eyes, pale faeces, dark urine and itchy skin.
- Inserting a small tube (stent) into the bile duct can sometimes relieve jaundice.

Pain

- Liver cancer can cause pain for some people, but usually only when the cancer is advanced.
- This pain can often be managed with pain medicines.
- Surgery or radiation therapy may also provide relief by reducing the size of a tumour that is causing pain.

Poor appetite and weight loss

- Cirrhosis and liver cancer can affect your appetite and you may lose weight.
- Radiation therapy and other cancer treatments can also have an impact on appetite and weight.
- It's important to eat and drink enough during and after treatment to maintain your weight.

Fatigue

Many people with liver cancer experience fatigue. This may be caused by the cancer or its treatment.

Fluid build-up

- Cirrhosis can increase pressure on the blood vessels inside the liver, forcing fluid to leak into the abdomen. This is called ascites.
- Initial treatment may include reducing salt in the diet and taking diuretics (water or fluid tablets).
- A procedure to drain the fluid – called paracentesis or ascitic tap – may also be used.

Confusion

Hepatic encephalopathy occurs when toxic substances build up in the blood. It can affect brain function and lead to confusion or disorientation.

Looking after yourself

Cancer can cause physical and emotional strain, so it's important to look after your wellbeing. Cancer Council has free booklets and programs to help you during and after treatment. Call 13 11 20 to find out more, or visit your local Cancer Council website (see back cover).

Eating well – Healthy food can help you cope with treatment and side effects. A dietitian can explain how to manage any special dietary needs or eating problems and choose the best foods for your situation.

▶ See our *Nutrition for People Living with Cancer* booklet.

Staying active – Physical activity can reduce tiredness, improve circulation and lift mood. The right exercise for you depends on what you are used to, how you feel, and your doctor's advice.

▶ See our *Exercise for People Living with Cancer* booklet.

Complementary therapies – Complementary therapies are designed to be used alongside conventional medical treatments. Therapies such as massage, relaxation and acupuncture can increase your sense of control, decrease stress and anxiety, and improve your mood. Let your doctor know about any therapies you are using or thinking about trying, as some may not be safe or evidence-based.

▶ See our *Understanding Complementary Therapies* booklet.



Alternative therapies are therapies used instead of conventional medical treatments. These are unlikely to be scientifically tested, may prevent successful treatment of the cancer, and can be harmful. Cancer Council does not recommend the use of alternative therapies as a cancer treatment.

Work and money – Cancer can change your financial situation, especially if you have extra medical expenses or need to stop working. Getting professional financial advice and talking to your employer can give you peace of mind. You can also check whether any financial assistance is available to you by asking a social worker at your hospital or treatment centre or calling Cancer Council 13 11 20.

▶ See our *Cancer and Your Finances* and *Cancer, Work and You* booklets.

Relationships – Having cancer can affect your relationships with family, friends and colleagues in different ways. Cancer is stressful, tiring and upsetting, and this may strain relationships. The experience of having cancer may also result in positive changes to your values, priorities or outlook on life. Give yourself time to adjust to what's happening, and do the same for those around you. It may help to discuss your feelings with each other.

▶ See our *Emotions and Cancer* booklet.

Sexuality – Cancer can affect your sexuality in physical and emotional ways. The impact of these changes depends on many factors, such as treatment and side effects, your self-confidence, and if you have a partner. Although sexual intercourse may not always be possible, closeness and sharing can still be part of your relationship.

▶ See our *Sexuality, Intimacy and Cancer* booklet.

Contraception and fertility – If you can have sex, you may need to use certain types of contraception to protect your partner or avoid pregnancy for a time. Your doctor will explain what precautions to take. They will also tell you if treatment will affect your fertility permanently or temporarily. If having children is important to you, discuss the options with your doctor before starting treatment.

▶ See our *Fertility and Cancer* booklet.

Life after treatment

For most people, the cancer experience doesn't end on the last day of treatment. Life after cancer treatment can present its own challenges. You may have mixed feelings when treatment ends, and worry that every ache and pain means the cancer is coming back.

Some people say that they feel pressure to return to "normal life". It is important to allow yourself time to adjust to the physical and emotional changes, and establish a new daily routine at your own pace. Your family and friends may also need time to adjust.

Cancer Council 13 11 20 can help you connect with other people who have had liver cancer, and provide you with information about the emotional and practical aspects of living well after cancer.

► See our *Living Well After Cancer* booklet.

Dealing with feelings of sadness

If you have continued feelings of sadness, have trouble getting up in the morning or have lost motivation to do things that previously gave you pleasure, you may be experiencing depression. This is quite common among people who have had cancer.

Talk to your GP, because counselling or medication – even for a short time – may help. Some people can

get a Medicare rebate for sessions with a psychologist. Cancer Council may also run a counselling program in your area.

For information about coping with depression and anxiety, call Beyond Blue on 1300 22 4636 or visit beyondblue.org.au. For 24-hour crisis support, call Lifeline 13 11 14 or visit lifeline.org.au.

Follow-up appointments

After treatment ends, you will have regular appointments to monitor your health, manage any long-term side effects and check that the cancer hasn't come back or spread. During these check-ups, you will usually have a physical examination and you may have blood tests, x-rays or scans. You will also be able to discuss how you're feeling and mention any concerns you may have.

People who still have hepatitis B or hepatitis C may be given medicines (antiviral therapy) to help manage these diseases and reduce the chance of the cancer coming back. Your doctor will also talk to you about the importance of not drinking alcohol, not smoking, eating healthy foods and exercising.

Check-ups will become less frequent if you have no further problems. Between follow-up appointments, let your doctor know immediately of any symptoms or health problems.

When a follow-up appointment or test is approaching, many people find that they think more about the cancer and may feel anxious. Talk to your treatment team or call Cancer Council 13 11 20 if you are finding it hard to manage this anxiety.

► See our *Emotions and Cancer* booklet.

What if the cancer returns?

For some people, liver cancer does come back after treatment, which is known as a recurrence. The cancer may come back in the liver, in nearby organs or in other parts of the body. This is why it's important to have regular check-ups. You may be offered more treatment – the options are described on pages 23–40 and may include drug therapy or

the insertion of a stent. Treatment will depend on the type of cancer you have, where it has spread, your general health and the types of treatment you have had before.

When cancer won't go away

For many people with primary liver cancer, the cancer cannot be cured. Talking to your health care team can help you understand your situation and plan for your future care. Palliative treatments (see page 40) may help control the growth of the cancer and manage the effects of cancer and/or its treatment. These treatments may allow you to continue doing the things you enjoy for months or even several years.

Learning that the cancer may not be cured can be very upsetting. You can call Cancer Council 13 11 20 for support and information or talk to the social worker or spiritual care practitioner (such as a chaplain) at your hospital or treatment centre.

- ▶ You may find our *Living with Advanced Cancer* and *Facing End of Life* booklets helpful at this time. You can also listen to our *The Thing About Advanced Cancer* podcast series.

“There is still a life to be lived and pleasures to be found and disappointments to be had. Living with advanced cancer is a different life, not just a journey towards death.” JULIE

Caring for someone with cancer

You may be reading this booklet because you are caring for someone with liver cancer. What this means for you will vary depending on the situation. Being a carer can bring a sense of satisfaction, but it can also be challenging and stressful.

It is important to look after your own physical and emotional wellbeing. Give yourself some time out and share your concerns with somebody neutral such as a counsellor or your doctor, or try calling Cancer Council 13 11 20. There is a wide range of support available to help you with the practical and emotional aspects of your caring role.

Support services – Support services such as Meals on Wheels, home help or visiting nurses can help you in your caring role. You can find local services, as well as information and resources, through the Carer Gateway. Call 1800 422 737 or visit carergateway.gov.au.

Support groups and programs – Many cancer support groups and cancer education programs are open to carers as well as to people with cancer. Support groups and programs offer the chance to share experiences and ways of coping.

Carers Australia – Carers Australia provides information and advocacy for carers. Visit carersaustralia.com.au.

Cancer Council – You can call Cancer Council 13 11 20 or visit your local Cancer Council website to find out more about carers' services.

▶ See our *Caring for Someone with Cancer* booklet.

Seeking support

A cancer diagnosis can affect every aspect of your life. You will probably experience a range of emotions – fear, sadness, anxiety, anger and frustration are all common reactions. Cancer also often creates practical and financial issues.

There are many sources of support and information to help you, your family and carers navigate all stages of the cancer experience, including:

- information about cancer and its treatment
- access to benefits and programs to ease the financial impact of cancer treatment
- home care services, such as Meals on Wheels, visiting nurses and home help
- aids and appliances
- support groups and programs
- counselling services.

The availability of services may vary depending on where you live, and some services will be free but others might have a cost.

To find good sources of support and information, you can talk to the social worker or nurse at your hospital or treatment centre, or get in touch with Cancer Council 13 11 20.



Family and friends can support you in different ways. Online tools such as Gather My Crew (gathermycrew.org.au) can help to coordinate offers of practical assistance when you are having treatment.

Support from Cancer Council

Cancer Council offers a range of services to support people affected by cancer, their families and friends. Services may vary by location.

Cancer Council 13 11 20



Our experienced health professionals will answer any questions you have about your situation and link you to local services (see inside back cover).

Information resources



Cancer Council produces booklets and fact sheets on more than 40 types of cancer, as well as treatments, emotional and practical issues, and recovery. Call 13 11 20 or visit your local Cancer Council website.

Legal and financial support



If you need advice on legal or financial issues, we may be able to refer you to qualified professionals. These services are free for people who can't afford to pay. Financial assistance may also be available. To find out more, call Cancer Council 13 11 20.

Practical help



Cancer Council can help you find services or offer guidance to manage the practical impacts of cancer. This may include helping you access accommodation and transport services.

Peer support services



You might find it helpful to share your thoughts and experiences with other people affected by cancer. Cancer Council can link you with individuals or support groups by phone, in person, or online. Call 13 11 20 or visit cancercouncil.com.au/OC.

Useful websites

You can find many useful resources online, but not all websites are reliable. These websites are good sources of support and information.

Australian

Cancer Council Australia	cancer.org.au
Cancer Council Online Community	cancercouncil.com.au/OC
Cancer Council podcasts	cancercouncil.com.au/podcasts
Guides to Best Cancer Care	cancer.org.au/cancercareguides
Australian Cancer Trials	australiancancertrials.gov.au
Cancer Australia	canceraustralia.gov.au
Carer Gateway	carergateway.gov.au
Carers Australia	carersaustralia.com.au
Department of Health and Aged Care	health.gov.au
Gastroenterological Society of Australia	gesa.org.au
GI Cancer Institute	gicancer.org.au
Haemochromatosis Australia	haemochromatosis.org.au
Healthdirect Australia	healthdirect.gov.au
Hepatitis Australia	hepatitisaustralia.com
Liver Foundation	liver.org.au
Pancare Foundation	pancare.org.au
Services Australia (including Centrelink and Medicare)	servicesaustralia.gov.au

International

American Cancer Society	cancer.org
American Liver Foundation	liverfoundation.org
British Liver Trust	britishlivertrust.org.uk
Cancer Research UK	cancerresearchuk.org
Macmillan Cancer Support (UK)	macmillan.org.uk

Question checklist

Asking your doctor questions will help you make an informed choice. You may want to include some of the questions below in your own list.

Diagnosis

- What type of liver cancer do I have? Is it a primary or a secondary cancer?
 - Has the cancer spread? If so, where has it spread? How fast is it growing?
 - Are the latest tests and treatments for primary liver cancer available in this hospital?
 - Will a multidisciplinary team be involved in my care?
 - Are there clinical guidelines for this type of cancer?
-

Treatment

- What treatment do you recommend? What is the aim of this treatment?
 - Are there other treatment choices for me? If not, why not?
 - If I don't have the treatment, what should I expect?
 - How long do I have to make a decision?
 - I'm thinking of getting a second opinion. Can you recommend anyone?
 - How long will treatment take? Will I have to stay in hospital?
 - Are there any out-of-pocket expenses not covered by Medicare or my private health cover? Can the cost be reduced if I can't afford it?
 - How will we know if the treatment is working?
 - Are there any clinical trials or research studies I could join?
-

Side effects

- What are the risks and possible side effects of each treatment?
 - Will I have a lot of pain? What will be done about this?
 - Can I work, drive and do my normal activities while having treatment?
 - Will the treatment affect my sex life and fertility?
 - Should I change my diet or physical activity during or after treatment?
 - Are there any complementary therapies that might help me?
-

After treatment

- How often will I need check-ups after treatment?
 - If the cancer returns, how will I know? What treatments could I have?
-

Glossary

abdomen

The part of the body between the chest and hips, which contains the stomach, spleen, pancreas, liver, gall bladder, bowel, bladder and kidneys. Also known as the belly.

ablation

Inserting needles or probes into the cancer to destroy cancer cells with heat, cold or alcohol.

adjuvant therapy

A treatment given after the main treatment to lower the risk that the cancer will come back.

advanced cancer

Cancer that is unlikely to be cured. In most cases, the cancer has spread to other parts of the body (secondary or metastatic cancer). Treatment can often still control the cancer and manage symptoms.

alcohol injection

A type of tumour ablation treatment that directs pure alcohol into a tumour to destroy the cancer cells.

alpha-fetoprotein (AFP)

A protein found in the blood of some people with liver cancer.

anaesthetic

A drug that stops a person feeling pain during a medical procedure. Local and regional anaesthetics numb part of the body; a general anaesthetic causes a temporary loss of consciousness.

angiogram

An x-ray of blood vessels.

angiosarcoma

A rare type of primary liver cancer that starts in the blood vessels.

ascites

Fluid build-up in the abdomen, making it swollen and bloated.

Barcelona Clinic Liver Cancer (BCLC) staging system

A set of criteria to guide management of hepatocellular carcinoma (HCC).

benign

Not cancerous or malignant.

bile

A substance produced by the liver and stored in the gall bladder. It helps the digestive system break down and absorb fats from food.

bile duct

One of a series of tubes that carries bile from the gall bladder through the liver to the bowel. See also common bile duct.

bilirubin

A dark yellow-brown substance found in bile. If bilirubin builds up in the body, it can cause jaundice. See also jaundice.

biopsy

The removal of a sample of cells or tissue from the body for examination under a microscope to help diagnose a disease.

bone scan

A technique to create images of bones on a computer screen. A small amount of radioactive dye is injected into a vein. It collects in the bones and is detected by a scanning machine.

bowel

The long, tube-shaped organ in the abdomen that is part of the digestive tract. The bowel has two main parts: the small bowel and large bowel.

catheter

A hollow, flexible tube through which fluids can be passed into the body or drained from it.

chemotherapy

A cancer treatment that uses drugs to kill cancer cells or slow their growth.

Child–Pugh score

A scoring system used to measure how well the liver is working based on the level of damage caused by cirrhosis.

cholangiocarcinoma

Primary liver cancer that starts in the cells lining the bile ducts. Also called bile duct cancer.

cirrhosis

A condition in which healthy liver cells are replaced by scar tissue.

clinical trial

A research study that tests approaches to prevention, screening, diagnosis or treatment, to see if they are better than current treatments.

common bile duct

The tube through which bile travels from the liver and gall bladder to the bowel.

core biopsy

A type of biopsy where a tissue sample is removed with a wide needle for examination under a microscope.

cryotherapy

The process of inserting a probe into a tumour to freeze and destroy cancer cells. Also called cryosurgery.

CT scan

Computerised tomography scan. This scan uses x-rays to create cross-sectional pictures of the body.

diuretic

A tablet to help the body get rid of excess fluid. Also called water tablets, diuretics may help to relieve ascites.

downstaging

Treatment to shrink a cancer so that it may become suitable for surgical treatment.

duodenum

The first section of the small bowel.

embolisation

Cutting off the blood supply to a cancer by blocking the blood vessels.

external beam radiation therapy (EBRT)

Radiation therapy delivered to the cancer from outside the body.

fatty liver disease

A build-up of fats in the liver that can damage the organ.

gall bladder

A small, pear-shaped organ on the underside of the liver that stores bile.

haemochromatosis

A condition that causes the body to absorb more iron than usual from food.

hepatectomy

Surgery to remove all or part of the liver.

hepatic artery

The main blood vessel carrying blood from the heart to the liver.

hepatic encephalopathy

A build-up of toxins in the body, which can affect brain function.

hepatitis

Inflammation in the liver, usually caused by a virus.

hepatoblastoma

A rare type of primary liver cancer that affects only young children.

hepatocellular carcinoma (HCC)

A type of primary liver cancer that starts in the main cells in the liver (hepatocytes). It is the most common type of primary liver cancer.

hepatocyte

The main cell type in the liver.

immunosuppressant

A medicine that reduces the actions of the immune system.

immunotherapy

Drugs that use the body's own immune system to fight cancer.

interventional radiologist

A doctor who specialises in using imaging scans to diagnose cancer and delivers some treatments, including selective internal radiation therapy (SIRT).

jaundice

A condition caused by high levels of a substance called bilirubin in the blood, which can occur when the bile ducts are blocked or the liver is not working properly. It causes yellow, itchy skin; the whites of the eyes to turn yellow; pale faeces (poo); and dark urine.

laparoscopic surgery

Surgery done through small cuts in the abdomen using a thin viewing instrument called a laparoscope. Also called keyhole surgery or minimally invasive surgery.

liver

A large organ in the top right side of the abdomen. The liver plays a key role in cleaning the blood and helping digestion.

liver cancer

Cancer in the liver. Usually refers to cancer that started in the liver (primary liver cancer). May also refer to cancer that has spread to the liver from somewhere else in the body (secondary liver cancer).

liver function test (LFT)

A blood test to see how well the liver is working before, during and after treatment.

lymph nodes

Small, bean-shaped structures found in groups throughout the body. They help

protect the body against disease and infection. Also called lymph glands.

malignant

Cancerous. Malignant cells can spread (metastasise) and, if they cannot be treated, eventually cause death.

metabolic-associated fatty liver disease (MAFLD)

A build-up of fat cells in the liver associated with obesity and type 2 diabetes. It was previously called non-alcoholic fatty liver disease (NAFLD), but may occur in people who drink alcohol.

metastasis (plural: metastases)

Cancer that has spread from a primary cancer in another part of the body. Also known as secondary cancer.

MRI scan

Magnetic resonance imaging scan. A scan that uses magnetic fields and radio waves to take detailed cross-sectional pictures of the body.

non-alcoholic fatty liver disease (NAFLD)

See metabolic-associated fatty liver disease (MAFLD).

palliative treatment

Medical treatment for people with advanced cancer to help them manage pain and other physical and emotional symptoms. Palliative treatment is an important part of palliative care.

pancreas

An organ in the digestive and endocrine systems. The pancreas produces insulin and some of the enzymes needed to digest food.

paracentesis

The drainage of excess fluid from the abdomen. Also called an ascitic tap.

partial hepatectomy

Surgery to remove part of the liver; may include removal of the gall bladder.

portal hypertension

High blood pressure in the portal venous system.

portal vein

A blood vessel carrying blood from the stomach and small bowel to the liver.

portal vein embolisation (PVE)

A procedure to block the vein supplying blood to one part of the liver, so that the other part of the liver will grow.

primary cancer

The original cancer. Cells from the primary cancer may break away and be carried to other parts of the body, where secondary cancers may form.

primary liver cancer

Cancer that started in the liver.

radiation oncologist

A doctor who specialises in treating cancer with radiation therapy. A radiation oncologist delivers stereotactic body radiation therapy (SBRT), which is also known as stereotactic ablative body radiation therapy (SABR).

radiation therapy

The use of targeted radiation to kill or damage cancer cells so they cannot grow, multiply or spread. The radiation is usually in the form of x-ray beams. This may be called radiotherapy.

radiotracer

A substance that contains a small amount of radioactive material.

resectable

Able to be surgically removed from the body.

resection

Surgical removal of part or all of a diseased organ or tumour.

secondary cancer

Cancer that has spread from a primary cancer in another part of the body. Also known as metastasis.

secondary liver cancer

Cancer that started in another part of the body, but has spread to the liver.

segmentectomy

Surgery to remove a small section of the liver.

selective internal radiation therapy (SIRT)

A type of internal radiation therapy used to treat liver cancers. Also called radioembolisation.

side effect

Unintended effect of a drug or treatment. Most side effects can be managed.

stage

The extent of a cancer and whether the disease has spread from the original site to other parts of the body.

stent

A metal or plastic tube placed into a blocked organ to create a passage for substances to pass through.

stereotactic body radiation therapy (SBRT)

A type of external radiation therapy that delivers high doses of precise radiation. It is also called stereotactic ablative body radiation therapy (SABR).

targeted therapy

Drugs that target specific features of cancer cells to stop the cancer growing and spreading.

thermal ablation

Treatment that uses extreme temperatures (thermal) to destroy cancer cells without actually removing them from the body.

tissue

A collection of cells of similar type that make up an organ or structure in the body.

transarterial chemoembolisation (TACE)

A treatment that injects chemotherapy directly into a tumour. This closes off the blood vessels so the cancer is starved of oxygen and nutrients.

transplant

When a diseased organ is removed and replaced by a healthy organ from a donor.

tumour

A new or abnormal growth of tissue on or in the body. A tumour may be benign (not cancer) or malignant (cancer).

tumour marker

Chemical produced by cancer cells and released into the blood. It may suggest the presence of a tumour in the body.

Markers can be found by testing blood or tumour samples.

type 2 diabetes

When the body doesn't produce enough insulin or does not use it properly. Type 2 diabetes is a risk factor for liver cancer.

ultrasound

A scan that uses soundwaves to create a picture of part of the body. It can be used to measure the size and position of a tumour.

unresectable

Not able to be surgically removed. Also called non-resectable.

Can't find a word here?

For more cancer-related words, visit:

- cancer council.com.au/words
- [cancervic.org.au/glossary](https://cancer vic.org.au/glossary)

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How you can help

At Cancer Council, we're dedicated to improving cancer control. As well as funding millions of dollars in cancer research every year, we advocate for the highest quality care for cancer patients and their families. We create cancer-smart communities by educating people about cancer, its prevention and early detection. We offer a range of practical and support services for people and families affected by cancer. All these programs would not be possible without community support, great and small.

Join a Cancer Council event: Join one of our community fundraising events such as Daffodil Day, Australia's Biggest Morning Tea, Relay For Life, Girls' Night In and other Pink events, or hold your own fundraiser or become a volunteer.

Make a donation: Any gift, large or small, makes a meaningful contribution to our work in supporting people with cancer and their families now and in the future.

Buy Cancer Council sun protection products: Every purchase helps you prevent cancer and contribute financially to our goals.

Help us speak out for a cancer-smart community: We are a leading advocate for cancer prevention and improved patient services. You can help us speak out on important cancer issues and help us improve cancer awareness by living and promoting a cancer-smart lifestyle.

Join a research study: Cancer Council funds and carries out research investigating the causes, management, outcomes and impacts of different cancers. You may be able to join a study.

To find out more about how you, your family and friends can help, please call your local Cancer Council.



Cancer Council

13 11 20

Being diagnosed with cancer can be overwhelming. At Cancer Council, we understand it isn't just about the treatment or prognosis. Having cancer affects the way you live, work and think. It can also affect our most important relationships.

When disruption and change happen in our lives, talking to someone who understands can make a big difference. Cancer Council has been providing information and support to people affected by cancer for over 50 years.

Calling 13 11 20 gives you access to trustworthy information that is relevant to you. Our experienced health professionals are available to answer your questions and link you to services in your area, such as transport, accommodation and home help. We can also help with other matters, such as legal and financial advice.

If you are finding it hard to navigate through the health care system, or just need someone to listen to your immediate concerns, call 13 11 20 and find out how we can support you, your family and friends.



If you need information in a language other than English, an interpreting service is available. Call 131 450.



If you are deaf, or have a hearing or speech impairment, you can contact us through the National Relay Service. accesshub.gov.au

*Cancer Council services and programs vary in each area.
13 11 20 is charged at a local call rate throughout Australia (except from mobiles).*

For information & support
on cancer-related issues,
call **Cancer Council 13 11 20**

Visit your local Cancer Council website

Cancer Council ACT
actcancer.org

Cancer Council Queensland
cancerqld.org.au

Cancer Council Victoria
cancervic.org.au

Cancer Council NSW
cancercouncil.com.au

Cancer Council SA
cancersa.org.au

Cancer Council WA
cancerwa.asn.au

Cancer Council NT
cancer.org.au/nt

Cancer Council Tasmania
cancer.org.au/tas

Cancer Council Australia
cancer.org.au

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To support Cancer Council, call your local Cancer Council or visit your local website.*

