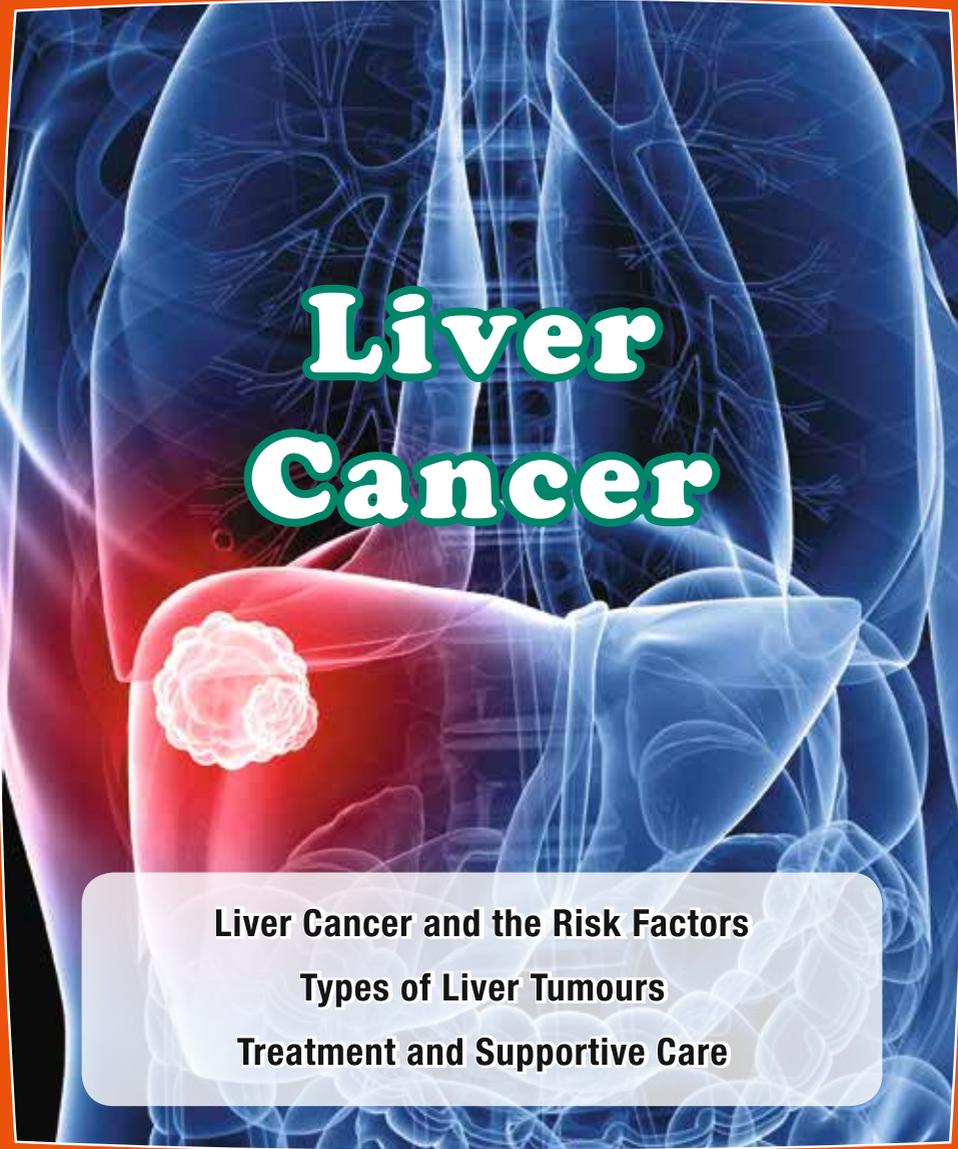


Inspired by Hope
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National Cancer
Centre Singapore
SingHealth



Liver Cancer

Liver Cancer and the Risk Factors
Types of Liver Tumours
Treatment and Supportive Care

An Educational Initiative by National Cancer Centre Singapore

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Disclaimer

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Introduction

Although Liver cancer or Hepatocellular Carcinoma (HCC) is the 6th most common cancer in the world, close to 80% of all patients with HCC are found in the Asia-Pacific. It is the 4th commonest cancer affecting men in Singapore. Approximately 80% are diagnosed too late for surgical resection, transplantation or radiofrequency ablation (for small lesions) which is potentially curative in the early stages of HCC.

Patients and their families often receive a lot of information and advice that can vary from helpful to contradicting and confusing. Often patients are asked to make quick treatment decisions during a period of intense personal and familial crisis, which can be very stressful.

We hope this booklet can help you understand more about liver cancer, its risk factors, signs and symptoms, treatment options and managing their side effects so that you can work with your doctor to make rational, thoughtful decisions about your treatment. The information in this booklet serves only as a guide and is not to be taken as medical advice. You need to discuss with your doctor the best treatment option for you. However, we hope this information will answer some of your questions and help you think about the questions to ask your doctors.

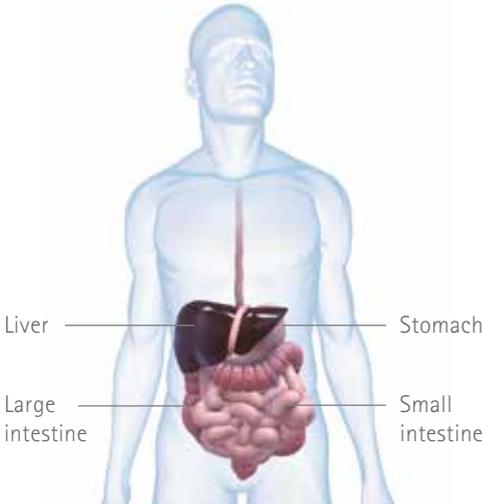
If you have any questions about the contents of this book, or if the information you are seeking is not covered here, please do not hesitate to contact the Cancer Helpline at 6225 5655 for more information.

Other cancer information booklets are also available at the National Cancer Centre Singapore's Cancer Education and Information Services and at the Comprehensive Liver Cancer Clinic. Contact the Cancer Helpline to request for a free copy. For electronic versions of this and other booklets, please visit our website: www.nccs.com.sg.

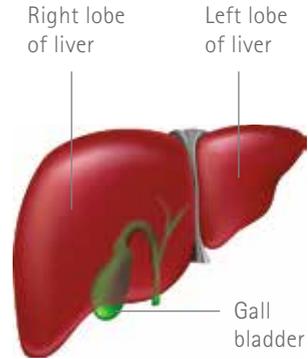
THE LIVER

The liver is one of the largest organs in the body and is located under the diaphragm in the right upper abdominal cavity on top of the stomach, right kidney, and intestines. The gall bladder is located on the under surface between the right and left lobes of the liver. Neighbouring organs include the pancreas, colon, intestines and right kidney.

Location of the Liver

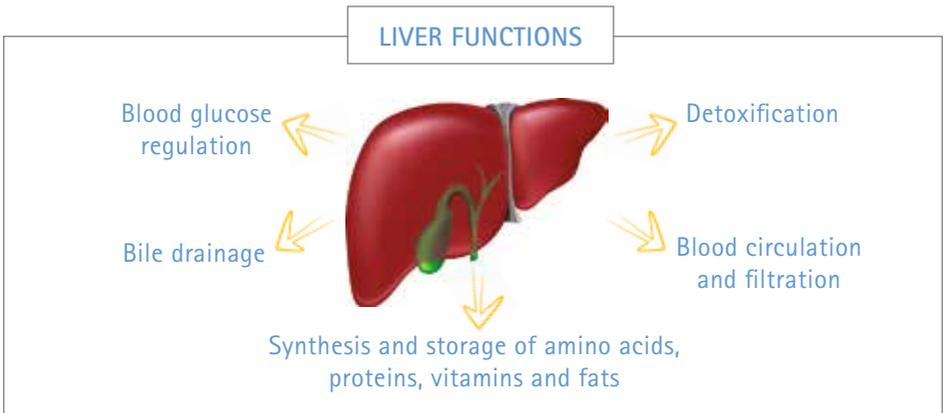


Lobes of the Liver



Functions of the Liver

The liver performs many important functions. It makes, regulates, and stores a variety of substances used by the body, and also serves important roles in metabolism and digestion.



The functions of the liver include:

1. Production of bile. Bile is formed in the liver. It is the chemical substance which breaks down the fats in food so that these can be easily absorbed by the intestines. Bile is secreted by liver cells and travels through the hepatic duct system into the gall bladder where it is stored until needed during a meal, when it is released into the small intestines to aid digestion.
2. Production of products that help in clotting of blood.
3. Storage of vitamins A, D, K and B12.
4. Regulates blood glucose (blood sugar) in the body by converting glucose to glycogen, and also serves as a store for glucose in the body.
5. Makes and stores proteins
6. Filters and destroys harmful substances from the blood (such as alcohol, poisons, toxins) – a process known as detoxification.
7. Destroys and gets rid of some types of waste products from the body. It does this by breaking down substances not used by the body so that they can be passed out in the urine or stools (bowel motions).

The healthy liver has an amazing ability to repair itself and can regenerate, but this ability can be decreased when the liver is diseased.

WHAT IS LIVER CANCER?

Normal cells divide and reproduce in an orderly manner. Your body relies on this orderly activity to repair injuries and replace worn-out cells. Sometimes this orderly process is disturbed. This can be due to mutations in the genes of cells. In the liver, mutations can be caused by chronic inflammation due to **viruses** (hepatitis B and C), **toxins** (alcohol, alfa-toxins) and **metabolic injuries** (non-alcoholic fatty liver disease (NAFLD), steatohepatitis (NASH)). Cells grow and divide out of control, producing extra tissue to form a mass or lump called a tumour. A tumour can be benign or malignant. Benign tumours are not cancers as they grow slowly and do not spread to other parts of the body.

Malignant tumours are cancerous growths and have the potential to spread to other parts of the body.

Malignant liver tumours are either primary or secondary. Primary tumours originate in the liver itself. Most primary liver cancers begin in hepatocytes which are liver cells. This type of cancer is called hepatocellular carcinoma (HCC) or hepatoma.

Primary liver cancer or Hepatocellular Carcinoma (HCC) occurs mainly in those aged 50's to 60's. It can also affect a younger individual who has contracted chronic hepatitis B or C from young. The majority of liver cancer patients in Singapore are Hepatitis B carriers as hepatitis B is endemic in the population and hence the need for vaccination in newborns and at-risk individuals. However, non-alcoholic fatty liver disease (NAFLD) is on the rise and has become an important cause of HCC.

The problem with HCC is that the tumour often goes unnoticed until it is fairly large. It can also develop "satellite" tumours in both lobes of the liver and can invade the blood vessels.

Metastatic or **secondary liver cancer** means the cancer in the liver comes from a spread to the liver from a cancer elsewhere in the body. The most common type of metastatic liver tumours are those caused by colon cancer that has spread to the liver. For purposes of this booklet, the discussion will be confined to primary liver cancer or HCC only so as to avoid confusion.

WHAT ARE THE RISK FACTORS ?

People with certain risk factors are more likely to develop primary liver cancer or HCC. The more risk factors a person has, the greater the chance that liver cancer will develop. However, many people with known risk factors do not develop the disease. If you think you may be at risk for liver cancer, you should discuss it with your doctor early.

The main risk factors in Singapore are:

Chronic Hepatitis B

The distribution of HCC worldwide follows closely the distribution of hepatitis B, which is currently the most important cause of HCC. In countries where there is universal vaccination for hepatitis B, the number of liver cancers have also begun to decrease with the decrease in the overall number of hepatitis B cases. Infection of liver cells with hepatitis B viruses causes DNA damage in liver cells. These viruses have their own DNA, which carries instructions on how to infect cells and produce more viruses. On top of this, chronic hepatitis B infection can also lead to liver cirrhosis (hardening of the liver) due to chronic inflammation which is an independent cause of HCC. The risk of an individual with chronic hepatitis B getting liver cancer is more than 100 times increased compared to a person who is not a hepatitis B carrier. Hepatitis B can be transmitted from an infected mother to her baby during pregnancy. In the adult setting, hepatitis B can be transmitted by contact with infected body fluids, e.g. blood, semen and other secretions. In patients with an increased number of viruses in the bloodstream, treatment with a class of drugs nucleos(t)ide analogues is recommended. Treatment of hepatitis B reduces the chances of developing HCC but does not eliminate it especially if the liver has already become cirrhotic.

Non-alcoholic Fatty Liver Disease (NAFLD)

Almost half the adult population in Singapore may have NAFLD and this can progress to non-alcoholic steatohepatitis (NASH), liver cirrhosis and HCC. NAFLD may develop into HCC directly without going through the stages of NASH and liver cirrhosis. NAFLD is related to diabetes mellitus and obesity but many patients with NAFLD are not obese. NAFLD and NASH are increasingly important causes of HCC in Singapore and globally.

Chronic Hepatitis C

Unlike hepatitis B, hepatitis C is an RNA virus and does not cause HCC by altering the DNA. Instead hepatitis C causes HCC by damaging the liver through chronic inflammation. The resulting liver cirrhosis creates the conditions leading to cancer formation. There is currently no vaccination for hepatitis C, which like hepatitis B is also transmitted by contact with infected bodily fluids. The WHO's updated 2018 guidelines recommend therapy for chronic hepatitis C with a class of drugs called pan-genotypic direct-acting antivirals (DAAs). DAAs can cure most persons with HCV infection, and treatment duration is short (usually 12 to 24 weeks), depending on the absence or presence of cirrhosis. Treatment of hepatitis C reduces the chances of developing HCC but does not eliminate it especially if the liver has already become cirrhotic.



Cirrhosis or Hardening of the Liver

People with liver cirrhosis, an irreversible condition in which healthy liver cells are replaced by scar tissue, are at greater risk for developing liver cancer and should undergo regular screening. Cirrhosis happens because of liver damage from a variety of causes, the commonest of which are hepatitis B or C infections, fatty liver and alcohol. Other causes include toxins, traditional herbs and other conditions. Cirrhosis can make surgical treatment of primary liver cancer more difficult.

Other risk factors:

Aflatoxin

is a harmful food contaminant made by certain molds that grow on poorly stored grains and nuts.

Inherited Metabolic Diseases

that affect the liver such as haemochromatosis, which causes excess deposits of iron in the body, or the condition alpha-1 antitrypsin deficiency, (both rare conditions), puts a person at a higher chance of developing HCC.

TYPES OF LIVER TUMOURS

Peripheral cholangiocarcinoma (bile duct cancer) is a more uncommon type of primary liver cancer compared to HCC. Benign or non-cancerous tumours sometimes grow large enough to cause problems but do not grow into nearby tissues or spread to other parts of the body.

BENIGN TUMOURS

Hemangioma

This is the most common type of benign liver tumour that are formed from blood vessels of the liver. These usually do not cause any symptoms and do not need treatment, although some may rarely bleed and need surgery to remove.

Hepatic Adenomas

These are benign tumours that start from liver cells known as hepatocytes. Most of these tumours do not cause symptoms but some eventually do cause pain or grow big enough to present as a mass in the abdomen. As there is a chance that the tumour could rupture and can eventually turn into liver cancer (pre-malignant tumours), most doctors usually advise surgical removal.

Focal Nodular Hyperplasia

Focal nodular hyperplasia (FNH) is a tumour-like growth of several cell types (hepatocytes, bile duct cells, and connective tissue). Although these tumours are benign, it can be hard to tell these apart from actual liver cancers unless a special MRI contrast is used in imaging. Both hepatic adenomas and FNH tumours are more common in women than in men. Other than HCC, malignant tumours of the liver can also arise from other cells within the liver.

MALIGNANT TUMOURS

Cholangiocarcinoma or Bile Duct Cancer

About 10% of cancers that start in the liver are cholangiocarcinomas. This cancer starts in the cells lining the bile ducts and is more common in women. Signs and symptoms may include abdominal pain, enlarged liver and jaundice (yellow colouration of the skin and eyes).

Angiosarcomas and hemangiosarcomas

These are rare cancers that begin in blood vessels of the liver. People who have been exposed to chemicals like vinyl chloride or thorium dioxide are more likely to develop these cancers. Other cases are thought to be due to exposure to arsenic or radium. These tumours grow quickly and are usually too widespread to be operated by the time they are diagnosed. The outlook for this disease is usually poor.

Hepatoblastoma

This is a very rare type of liver cancer that is usually found in children less than 4 years old. The cells of hepatoblastoma are similar to fetal liver cells. About 70% of children with this disease are treated successfully and survival rate is over 90% for early hepatoblastoma, as it usually responds well to surgery and chemotherapy.

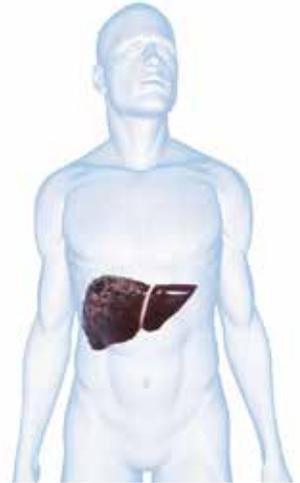
Secondary Liver Cancers

In contrast to primary liver cancers that start in the liver, metastatic or secondary liver tumours are those that develop in other organs (such as the pancreas, colon, stomach, breast or lung) and spread or metastasize to the liver. These tumours are named after their primary site. For example, cancer that started in the colon and spread to the liver is called metastatic colon cancer.

SIGNS AND SYMPTOMS

In most patients with liver cancer there are often no symptoms, even when the tumour has grown to a large size. Sometimes, however, as cancer advances, symptoms may show and these can include:

- unexplained and unintentional weight loss
- feeling of weakness and lethargy
- loss of appetite
- feeling very full after a small meal
- nausea or vomiting
- fever
- abdominal swelling or bloated abdomen
- a mass felt under the ribs on the right side because of an enlarged liver
- a mass felt under the ribs on the left side because of an enlarged spleen
- yellowing of the skin and eyes (jaundice)
- enlarged veins on the belly that become visible through the skin
- dark coloured urine



HOW IS LIVER CANCER DIAGNOSED?

Multi-phasic Imaging

The standard of care in the diagnosis of HCC is through multi-phasic imaging with CT Scans or MRI. In high risk patients, regular screening is carried out using abdominal ultrasound (US) and a blood test for serum alpha-feto protein (AFP - a cancer marker). If either the US examination or serum AFP is abnormal then multi-phasic imaging is carried out to confirm the diagnosis.

- **Abdominal Ultrasound**

This test uses high-frequency sound waves to scan the abdomen. Tumours may produce echoes that are different from the echoes made by healthy tissues. The sound waves produce a pattern of echoes as these bounce off internal organs. The echoes create a picture of the liver and other organs in the abdomen.

- **Multiphasic CT Scan**

The CT scan is an x-ray procedure that produces detailed cross-sectional images of your body. This test is very useful in identifying many types of liver tumours. It can provide precise information about the size, shape, and position of any tumours in the liver or elsewhere in the abdomen.

A contrast media is injected into the vein of the patient to better outline structures of the body before any pictures are taken. Instead of taking one picture like a standard x-ray, a CT scanner takes many pictures as it rotates around you. A computer then combines these into images of slices of the part of your body that is being studied.

- **Magnetic Resonance Imaging (MRI)**

MRI scans use magnetic waves created by strong magnets instead of x-rays to create images of soft tissues in the body. MRI can generate thin section images of any part of the body. A contrast media is often injected into a vein before the scan to see details more clearly. A computer translates the pattern into a very detailed image of parts of the body. MRI scans can be very helpful in looking at liver cancers. Most times, they are especially helpful at differentiating a benign tumour from a malignant one.



Other Procedures

- **Biopsy**

Although biopsies are performed in many other cancers to obtain a diagnosis, for HCC, a biopsy is often not necessary and not usually advised as this carries potential risk of bleeding and of spreading the tumour. A biopsy is therefore only advised by the doctor if there is uncertainty in diagnosis based on other methods.

- **Laboratory Tests**

Your doctor may order laboratory blood tests for a number of reasons:

- to help differentiate HCC from other cancer
- to determine how well the liver is working i.e. liver function, which may determine what type of treatments you can have
- to get an idea of your general health and how well your other organs are working, which also may determine what type of treatments you can have
- to see how well treatment is working
- to look for signs that the cancer has come back after treatment

- **Alpha-fetoprotein (AFP)**

This test is helpful in screening for HCC in high risk patients. People with liver cancer usually have increased levels of AFP in their blood. However, in up to 30% of patients with HCC, the AFP can be normal. Other causes of a raised AFP include liver damage from hepatitis, tumours of the testis, or stomach cancer. By itself, the AFP test has little significance and must be interpreted together with a proper imaging study of the liver.

A low or normal value on this test does not mean that HCC is not present, but a very high level usually means liver cancer. It can also be useful to determine how well treatment is working, as the AFP level should decrease after treatment. It can be used during follow up as well, to look for possible signs that the cancer may have come back (recurred).

Other blood tests

- **Liver function tests (LFTs)**

Because liver cancer often develops in damaged livers, doctors need to know the health of your liver before starting your treatment. A series of blood tests can help with this. These tests can assess the health of the part of your liver not affected by the cancer. These measure levels of certain substances in your blood, such as bilirubin, albumin, alkaline phosphatase, etc. If your liver is not healthy, you may not be able to have surgery, especially if the surgery requires removal of a large part of your liver.

- **Blood clotting tests**

The liver also makes proteins that help blood to clot when you are bleeding. A damaged liver may not make enough of these clotting factors, which could increase your risk of bleeding. Your doctor may order blood tests, such as a prothrombin time (PT), to assess this risk.

- **Tests for viral hepatitis**

If chronic viral hepatitis has not been previously diagnosed, your doctor may also order other blood tests, such as tests for hepatitis B and C. Results showing you have been infected with either of these viruses may mean that treatment for these viruses may need to be initiated.

- **Kidney function tests**

Tests of blood urea nitrogen (BUN) and creatinine levels are often done to assess how well your kidneys are working as these can sometimes be affected in liver disease, and may also affect what treatment options are possible.

- **Full blood count (FBC)**

This test measures levels of red blood cells, white blood cells (which fight infections), and platelets (which help the blood clot). Levels can be abnormal when there is liver damage.

STAGING OF LIVER CANCER

Staging is part of the diagnostic process and consists of gathering detailed information about the tumour to determine how advanced the cancer is. The exact stage of your cancer will determine the treatment options.

During staging, the tumour is assessed and classified according to a specific tumour classification system. The common systems are the American Joint Cancer Committee (AJCC) TNM staging system which looks at the tumour burden and the Barcelona Clinica for Liver Cancer (BCLC) system. Separately, the function of the liver can also be assessed using the Child-Pugh score.



HOW DOES LIVER CANCER SPREAD?

Liver cancer can spread (metastasize) outside the liver to the nearby lymph nodes, lungs and bones. Rarely it also spreads to other organs. When this happens, the new tumour has the same kind of abnormal cells as the primary tumour in the liver. For example, if liver cancer spreads to the bones, the cancer cells in the bones are actually liver cancer cells. The disease is metastatic liver cancer, not bone cancer and is treated as a spread of liver cancer.

WHAT TYPES OF TREATMENT ARE USED?

The best treatment for HCC should be individualized to each patient and depends on:

- The stage of the cancer
- The underlying liver function of the patient
- The general health and fitness of the patient
- The availability of specialized treatment

The patient should be assessed by a **multi-disciplinary team** of specialists to determine which modality of treatment is best suited for a particular patient. This is because the different types of treatment require different specialists – surgeons, interventional radiologists, nuclear medicine physicians, medical oncologists, radiation oncologists and palliative medicine specialists. At the National Cancer Centre Singapore, such multi-disciplinary care is available through the **Comprehensive Liver Cancer Clinic**.

Early stage HCC

This is defined as single tumours less than or equal to 5 cm, or not more than 3 tumours each less than or equal to 3 cm, the absence of invasion of blood vessels on imaging and absence of spread outside of the liver i.e. metastases.

If the liver function is good, **surgical resection** gives the best long-term survival and is the treatment of choice. Five-year survival between transplantation and liver resection are similar in early liver cancer with good liver function.

If the liver function is poor the recommended treatments are **radiofrequency ablation** and **liver transplantation** as surgical resection is not possible in these cases.

Radiofrequency ablation (RFA) uses heat to destroy tumour cells in the liver. Radiofrequency ablation is used to treat liver tumours not suitable for surgical resection but the best outcomes are when there are 3 or fewer tumours and each is not larger than 3 cm.

During the procedure, under the imaging guide of ultrasound or sometimes CT scan, the RFA needle electrode is inserted through the skin under local anesthetic and placed into the tumour. As the radiofrequency current passes through the needle electrodes, the heat created by the current spreads out within the tumour, destroying it.

Locally Advanced HCC

Most patients with HCC present at this stage which is beyond early stage but the cancer has no distant spread or metastases.

The mainstay of treatment in locally advanced HCC is loco-regional treatment of which the main types are **transarterial chemoembolization (TACE)** and **Selective Internal Radiation Therapy (SIRT)** also known as transarterial radioembolization or TARE.

When the blood vessels of the liver are invaded by cancer only SIRT may be used safely.

In TACE, chemotherapeutic drugs are introduced into the cancer through a catheter inserted through the groin or wrist and threaded to the liver via arteries. In SIRT, radioactive particles are introduced in the same way.

TACE will need to be repeated a number of times (average 3 times) but most patients (about 90%) of patients treated with SIRT need to be treated only once.

Outcomes with **surgical resection** in carefully selected patients with good function without major invasion of blood vessels can be superior to loco-regional therapy. **Liver transplantation** can also be carried out in patients using the extended of UCSF/Stanford criteria.

Metastatic/advanced HCC

In patients with good liver function, systemic therapy is the recommended treatment of metastatic HCC. Two such drugs are currently proven to be equally useful as first line therapy in this group of patients namely **sorafenib** and **lenvatinib** but with slightly different side effect profiles. Combination therapy with two drugs **atezolizumab** and **bevacizumab** have been shown in a large clinical trial to be superior to sorafenib in advanced HCC.

Immuno-therapy using a class of drugs called **check-point inhibitors** has emerged as useful therapy in HCC as well. Two such drugs have been approved to be used in the second-line setting in advanced HCC namely **nivolumab** and **pembrolizumab**. Two other non immuno-therapy drugs have also shown efficacy as second-line therapy in HCC namely **ramucirumab** and **carbozantinib**.

Many clinical trials with combination therapies are ongoing in advanced HCC and the field is progressing rapidly.

When liver function is poor, treatment options are limited to palliative care.

Palliative Care

When treatment is not possible or ineffective, there are several ways of easing any symptoms you may have. This is known as palliative therapy.



- **Pain Control**

Pain is not a common problem for people with liver cancer. However, should it occur, there are several effective painkillers available, which the doctor can prescribe.

- **Ascites**

Ascites, collection of fluid in the peritoneal cavity can make you feel breathless and uncomfortable. The swelling can prevent your lungs from fully expanding as you breathe. Ascites can often be reduced by taking medicine (diuretics), which the doctor can prescribe. These are drugs, which encourage the body to excrete excess fluid as urine, rather than allowing it to collect in the body.

Inserting a small tube into the abdomen to drain off the excess fluid can also relieve ascites. This is known as an abdominal tap, and usually needs to be done in hospital, with a local anaesthetic, and can be repeated as necessary. An in-dwelling tube can sometimes be placed if there is excessive ascites that needs to be drained frequently.

• Jaundice

Jaundice occurs if the bile duct (the tube which connects the liver to the ileum) is blocked. It causes the skin to turn yellow and feel itchy. The itching may sometimes be relieved by medicines which the doctor can prescribe. Sometimes the jaundice itself can be relieved by the doctor inserting a narrow tube into the bile duct to keep it open and overcome the blockage which caused the jaundice.

Sometimes the jaundice occurs because the liver function is impaired. In this situation of liver failure, the treatment is supportive.

MAKING DECISIONS ABOUT TREATMENT

Sometimes it is difficult to make decisions about what the right treatment for you should be. You may feel that everything is happening so fast that you do not have the time to think things through. While some people feel they are overwhelmed with information, others may feel that they do not have enough information. It is very important to realize that there is frequently no single correct way to cope with cancer.

MULTI-DISCIPLINARY TUMOR BOARD

As can be seen above, treatment for HCC is advancing at a rapid pace and new and better therapies are becoming available. The optimal treatment for a specific patient thus requires discussion among a few doctors from different disciplines such as surgery, medical oncology, interventional radiology, nuclear medicine, radiation oncology and diagnostic radiology. Such discussions occur in the context of a multi-disciplinary tumor board (MDTB) which seeks to customize the best treatment or combination of treatment for a specific patient. Sometimes new therapies are only available through participation in a clinical trial.

At the National Cancer Center Singapore, patients with HCC have their cases discussed at the MDTB of the **Comprehensive Liver Cancer Clinic**.

SEEKING A SECOND OPINION

You may feel that you want to ask for a second opinion from another specialist. The reasons for wanting a second opinion vary. Sometimes, it is the wish to make sure that everything possible is being done to get the best treatment. Sometimes, it is to get confirmation of bad news that is otherwise difficult to accept and sometimes it is just to get clarification of what is going on.

This is understandable and can be a valuable part of your decision making process. You can still ask for a second opinion even if you have already started treatment or still want to be treated by your first doctor.

Before you see the doctor, it may help to write down your questions. To assist you, below is a list of questions to ask your doctor. Taking notes during the session can also help. Many people like to have a family member or friend to go with them, take part in the discussion, take notes or simply listen.

QUESTIONS YOU CAN ASK YOUR DOCTOR

You may find the following list of questions helpful when thinking about what to ask your doctor.

About your illness

1. What type of cancer do I have?
2. What is the stage of my cancer?
3. Is my type of cancer hereditary?

About tests

1. What are these tests for?
2. What will these investigations involve?
3. What are the risks for doing this test?
4. Will the results of this test make any difference to the treatment you provide?
5. How much will these tests cost?



About treatment

1. What are the treatments available for my type of cancer?
2. What treatment would you recommend and why?
3. What is the aim of the treatment?
 - Is it for cure?
 - Is it for temporary control?
 - Is it to reduce symptoms?
4. What are the benefits of this treatment?
5. What are the possible side effects of this treatment?
6. Can these side effects be prevented or controlled?
7. Are these side effects temporary or permanent?
8. How long is the treatment?
9. How does the treatment work and how is it given?
10. Can I take any herbal medicine or supplements during my treatment?
11. What will happen if I choose not to have any treatment?
12. Can I go back to work while I am on treatment?
13. Will I receive treatment as an outpatient or be admitted to the hospital?
14. What difference will this treatment make to my quality of life e.g. work, social, physical and sexual activity?

About follow-up

1. How often must I come back for check-up?
2. Who should I contact if I want to change my appointments?

If you have other questions, you may want to add on to the list. Feel comfortable to ask the doctor to explain the answers to you again if you do not understand them. It is also useful to write down the points you have discussed to act as a reference and reminder when you need them.

SUPPORTIVE CARE

Recovery and follow-up are different for each person and depend on the treatment you have received. Supportive care helps people and their families to cope with cancer and its treatment and to continue with their lives as normally as possible. It should begin from the moment cancer is suspected, through diagnosis and treatment, and for as long afterwards as is necessary. It takes time to recover. There are physical and emotional changes to cope with, maybe in your appearance, your speech or what you can eat.

Your family and friends may need as much support and guidance in coping with their feelings as you do. There is no right or wrong way to feel and you do not need to struggle with your illness alone. Coping or overcoming cancer is easier for both the patient and family when there are helpful information and support services. Here are some support services you may wish to consider contacting if you need them.

Medical Social Services

The Medical Social Service Department at the hospital provide quality patient care which would enhance emotional support, financial aid, home care, transportation or rehabilitation. You will need a doctor's referral to the medical social worker.

Patient Support Programmes

NCCS Patient Support Programmes strive to provide a holistic approach to support you and your loved ones in cancer management. The Patient Support Programmes are designed to help you and your loved ones in:

- Discussing issues, concerns, and difficult decisions in a safe and supportive environment
- Making informed and effective decisions on concerns pertaining to, and coping with your illness
- Building resilience and resources to maintain a meaningful lifestyle
- Promoting communication and bonding

Patient Support Programmes include:

- Psycho-educational Talks & Trainings
- Therapeutic Groupwork & Group Therapies
- Interest Groups
- Enrichment Programmes
- Social & Recreational Gatherings

NCCS Patient Support Programmes are open to all cancer patients, survivors and caregivers in Singapore. For more information & registration, please contact Patient Support Programmes at:

 (65) 6588 0520 or Cancer Helpline at (65) 6225 5655

 patientsupport@nccs.com.sg

 <https://www.nccs.com.sg/patient-care/specialties-services/pages/patient-support-programmes.aspx>

Cancer Helpline

Everyone has different needs when it comes to cancer. You may want to talk to someone about what you are going through. The Cancer Helpline at the National Cancer Centre Singapore provides a listening ear. Our aim is to help you through your cancer experience. Trained nurse counsellors operate this service. They provide cancer information, emotional and psychological support, counselling and linkage to health, welfare and cancer support services for people affected by cancer.

Each contact with a nurse counsellor is private, confidential and anonymous. They do not give medical advice and treatment recommendations but can assist in clarifying your doubts and putting into perspective the information you may have received from your own treating doctor. To speak to the nurse counsellors, please call: 6225 5655 or email at cancerhelpline@nccs.com.sg



FOLLOW-UP CARE

Follow-up checks always cause anxiety. This can make it difficult to put the experience of cancer behind you. But regular follow-up with your doctor is necessary and very important in monitoring your recovery. These check-ups may include x-rays, blood tests and other physical examinations. If you have any concerns or suspicions about your health in between follow-up care, make an earlier appointment to see your doctor.

When should you call the doctor?

After treatment, you are likely to be more aware of your body and the slight changes in how you feel from day to day. If you have any of the problems listed below, tell your doctor at once.

1. Pain that does not go away, especially if it is always in the same place
2. Lumps, bumps or swelling
3. Nausea, vomiting, diarrhoea, loss of appetite, or difficulty swallowing
4. Unexplained weight loss
5. Fever or cough that does not go away
6. Rashes, bruises, or bleeding
7. Any other signs as mentioned by your doctor or nurse

What the future holds

Treatment side effects last for a few months even after you have completed the treatment. When the body cells have recovered the discomfort will disappear.

Eating a well balanced diet and keeping a healthy lifestyle will enable you to keep in good general health. Perform activities and exercises within your own limits and do not over exert yourself. You can also return to work if you and your doctor feel that you are well enough to do so. Some people prefer to return to work between treatments while some defer returning to work until after they have completed all treatments. Treatment times can be arranged to suit your needs.



TREATMENT AND SUPPORT UNITS AT NCCS

Department of Radiation Oncology

National Cancer Centre Singapore
Basement 3 & 4
Enquiry line: 6436 8600
Registration counter: 6436 8181

Singapore General Hospital
Blk 2 basement 1
Enquiry line: 6436 8600
Registration counter: 6321 4211

Useful Contact Details

- Appointment Scheduling Unit : 6436 8088
- General Enquiries : 6436 8000
- Dept of Psychosocial Oncology : 6436 8126
- Patient Support Programmes : 6588 0520
- Outpatient Pharmacy Helpdesk : 6436 8091
- Cancer Helpline : 6225 5655



CANCER RESOURCES ON THE INTERNET

American Cancer Society
<http://www.cancer.org>

National Cancer Institute, USA
www.cancer.gov

Macmillan Cancer Support
www.macmillan.org.uk

National Cancer Centre Singapore
www.nccs.com.sg



SOME USEFUL DEFINITIONS

Ascites

- A buildup of fluid in the abdomen, making it swollen and bloated, which can be caused by the presence of cancer within the abdominal cavity.

Benign

- not cancerous, that is not malignant

Biopsy

- The removal of a small sample of tissue from the body for examination under a microscope to help in diagnosing a disease. A needle biopsy, involves using a fine needle to suck up a few cells. An open biopsy (or surgical biopsy) involves a small operation, and is usually done under general anaesthetic: see diagnosis, frozen section.

Jaundice

- Yellow discolouration of the skin, mucous membranes and sclera of the eyes, caused by increased amounts of bilirubin.

Palliative care

- When it is agreed that cure is no longer possible, palliative care, which does not try to cure the disease, aims to promote comfort, relieve symptoms, and maximize the quality of life. It seeks to address the full range of physical, emotional and spiritual needs of both patient and family.

Primary tumour

- A malignant tumour starts in one site of the body where it is known as the primary tumour. At a later stage, cancer cells may break away from it and be carried to other parts of the body, where they may lodge and increase to form secondary tumours or metastases.

Prognosis

- The outlook or expected outcome of a disease.
- The length of time the person is expected to live.

Secondary tumour / metastasis

- An extension of the primary tumour. It develops in a part of the body away from the original (primary) tumour and is carried by the lymph and blood systems to other parts of the body they are said to metastasise. Even though the metastasis may be far away, it is not a new cancer.

Tumour

- A new or abnormal growth of tissue in or on the body. A tumour may be benign or malignant (a cancer). The term "neoplasm" usually describes malignant tumours.

For more information on cancer, please call the
**Cancer Helpline at Tel: 6225 5655 or
email cancerhelpline@nccs.com.sg**

MONDAYS - FRIDAYS : 8.30am to 5.30pm

SATURDAYS, SUNDAYS : CLOSED (Please leave a message)
& PUBLIC HOLIDAYS

THIS IS A PUBLIC EDUCATION INITIATIVE BY:

Cancer Education & Information Services

Division of Supportive and Palliative Care

National Cancer Centre Singapore

30 Hospital Boulevard

Singapore 168583

Tel: 6225 5655

Website: www.nccs.com.sg

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