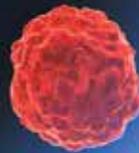


Inspired by Hope
Committed to Care



National Cancer
Centre Singapore
SingHealth

Stomach Cancer



An Educational Initiative by National Cancer Centre Singapore

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The National Cancer Centre Singapore does not endorse or promote the use of any product mentioned in this booklet. The information is presented in a summary to provide understanding and knowledge only. It does not recommend the self-management of health problems or replace consultation with your doctor. You should never disregard medical advice or delay seeking it because of something you have read here.

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Introduction

Stomach cancer is one of the top 10 cancers affecting men and women in Singapore. It ranks 8th and 10th among males and females respectively (Singapore Cancer Registry Annual Report, 2022). It more commonly occurs in men and individuals aged between 50 and 70 years old. During the period between 2018 - 2022, there were 1400 deaths due to stomach cancer.

This booklet has been developed to help you learn more about stomach cancer. It discusses risk factors, signs and symptoms, how a diagnosis is made, treatment options, managing treatment side effects and supportive care. We hope this booklet will provide you with relevant information and answer some of the questions you may have.

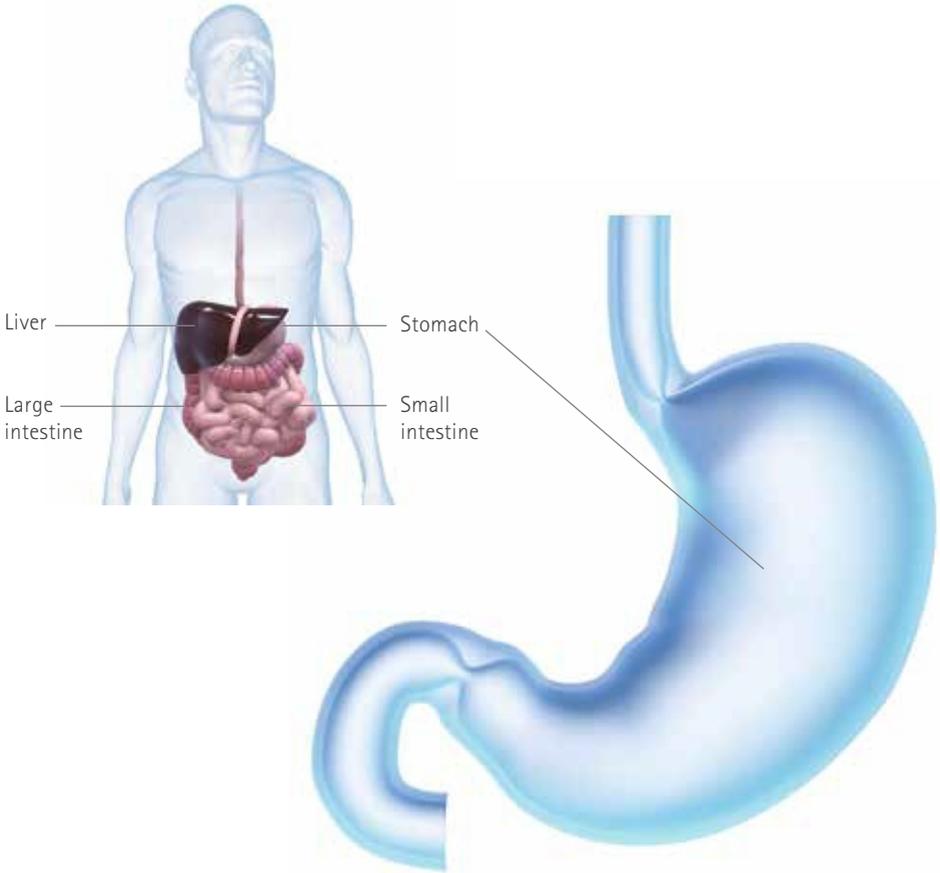
This booklet serves only as a guide and its contents are not to be taken as medical advice. You will still need to discuss with your doctor the best treatment option for you. If you have any questions about the contents of this book, or if the information you are seeking is not covered here, please do not hesitate to contact the Cancer Helpline via telephone at 6225 5655 for more information.

If you have found this booklet useful, you may wish to share it with someone who you think will benefit from it.

For electronic version of this booklet, please visit National Cancer Centre Singapore's website: www.nccs.com.sg.

WHAT IS STOMACH CANCER?

Stomach cancer is a disease that begins in the stomach, the part of the digestive system which contains, breaks down and digests the food we eat. It is a hollow, muscular organ shaped like a large pouch, located in the upper abdomen, under the ribs. The upper part of the stomach connects to the oesophagus and the lower part leads to the small intestine. Stomach cancer, which is also known as gastric cancer, can affect any part of the stomach.



Stomach cancer forms when cells in the stomach mutate in a way that cause them to grow and divide abnormally causing an ulcer or a mass to form within the stomach. The mass or tumour can eventually spread through the entire wall of the stomach and spread to other parts of the body.

TYPES OF STOMACH CANCER

There are different types of stomach cancer, classified by cell type and where the cancer begins.

- **Adenocarcinoma:** The most common type of stomach cancer, which accounts for 90-95% of stomach cancers, is adenocarcinoma, which starts in the glandular cells of the stomach lining. Adenocarcinoma may also be classified based on how they look under the microscope – intestinal and diffuse subtypes. Diffuse adenocarcinomas tend to grow and spread more aggressively and are harder to treat.
- **Gastrointestinal stromal tumours (GIST):** GIST is a rare type of soft tissue sarcoma, which forms in the interstitial cells of Cajal (cells in the gastrointestinal tract) and other digestive organs.
- **Gastric lymphoma:** A cancer of the immune system that forms in the stomach wall. They can be mucosa-associated lymphoid tissue (MALT) gastric lymphoma or diffuse large B-cell lymphoma of the stomach.
- **Neuroendocrine tumours or carcinoid tumours:** Cancer which starts in the neuroendocrine cells, nerve-like and hormone-producing cells, of the stomach.

CAUSES AND RISK FACTORS OF STOMACH CANCER

While the exact cause of stomach cancer is unknown, several factors have been found to play a role in its development. These risk factors include:

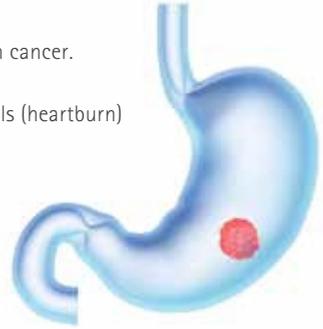
- A chronic infection by a bacteria called Helicobacter Pylori
- Gastroesophageal reflux disease
- A diet high in salted or preserved (cured/smoked/pickled) foods
- A diet low in fruits and vegetables
- Smoking and alcohol
- Family history of stomach cancer
- Hereditary syndromes such as Familial Adenomatous Polyposis (FAP), Li-Fraumeni syndrome, Hereditary Nonpolyposis Colorectal Cancer (HNPCC) and Peutz-Jeghers syndrome
- Medical conditions that may contribute to stomach cancer such as:
 - Anaemia (megaloblastic anaemia and pernicious anaemia)
 - Previous stomach surgeries with partial removal of the stomach (gastrectomy)
 - A stomach disorder called Atrophic gastritis, which results in a lower-than-normal production of digestive juices
 - Stomach polyps

These risk factors are more commonly seen in people who have stomach cancer. Having one or more of these risk factors does not mean that you will develop stomach cancer. Stomach cancer may still develop in patients with none of the above risk factors.

SYMPTOMS OF STOMACH CANCER

There are often no or mild symptoms in the early stages of stomach cancer. As the cancer progresses, symptoms may show and may include:

- Persistent indigestion (reflux) or a burning sensation after meals (heartburn)
- Upper abdominal discomfort or pain after a meal
- Feeling bloated after eating
- Feeling very full after a small meal
- Loss of appetite
- Unexplained and unintentional weight loss
- Nausea or vomiting
- Blood in the stools or black stools



When stomach cancer is more advanced it may be possible for a healthcare professional to feel a mass in the stomach.

WHEN TO SEE A DOCTOR

Make an appointment with your doctor if you have any signs or symptoms that worry you.

HOW TO PREVENT?

There are several ways to lower the risk of stomach cancer:

- Reduce the consumption of salted and preserved foods.
- Adopt a diet with high intake of fruits and vegetables. Vitamin A and C, in particular, appear to lower the risk of stomach cancer.
- Avoid smoking and inhaling second-hand smoke.
- Exercise regularly and maintain a healthy weight.

Screening for stomach cancer

Tests are sometimes used to screen for stomach cancer in people who do not have symptoms. Individuals at higher risk for stomach cancer may be recommended to undergo screening for stomach cancer. They are the same tests used to diagnose stomach cancer.

DIAGNOSIS OF STOMACH CANCER

Tests and procedures used to diagnose stomach cancer include:

- **Upper endoscopy or gastroscopy**

During the procedure, an endoscope (a thin fibre-optic tube containing a small camera) is passed through the mouth and down the throat to check for abnormal areas in the oesophagus, stomach and duodenum.

- **Biopsy**

If any suspicious areas are discovered during the endoscopy, a tissue sample may be taken and sent to the lab for testing and analysis.

- **Barium meal X-ray**

The patient will be given a liquid containing barium to swallow. This outlines the stomach wall to help locate any tumours or abnormal areas. X-rays of the oesophagus and stomach will then be taken.

- **Faecal occult blood test**

A lab test performed to determine the presence or absence of hidden (occult) blood in the stool.

If stomach cancer is diagnosed, further tests may be required to determine if the cancer has spread and to determine the stage of the cancer. Some of the tests include:

- **Computerised Tomography (CT) Scan**

A CT scan is a type of scan where x-ray beams are rotated around the body to produce a series of x-ray images photographed from different angles. A CT scan is able to show the stomach clearly to confirm the location of the cancer. This test can also be used to look for cancer that has spread to the lymph nodes, liver or abdomen.

- **Positron Emission Tomography (PET) Scan**

Positron Emission Tomography (PET) scan uses radiation to produce 3-D images of the body. Due to the unique characteristics of stomach cancer, PET scan may not be able to detect certain types of stomach cancer.

- **Exploratory surgery**

Exploratory surgery may be recommended to look for signs that the cancer has spread beyond the stomach. This is usually performed laparoscopically (via key-hole surgery), where several small incisions are made and a special camera is inserted into the abdominal cavity to check for the spread of the cancer.



STAGING OF STOMACH CANCER

The information obtained from the tests used to diagnose stomach cancer may also be used to stage the cancer. They are:

- **Stage 0:** The tumour is small and only present on the inside surface of the stomach.
- **Stage 1:** The tumour has penetrated into the inner walls of the stomach.
- **Stage 2-3:** Tumours spread deeper into the walls of the stomach with possible spread to nearby lymph nodes.
- **Stage 4:** Tumours have spread through the stomach and to nearby organs. This may also include spread to other parts of the body such as the lymph nodes and to the lining around organs in the abdomen called the peritoneum.

TREATMENT OF STOMACH CANCER

There are a few effective treatment options for stomach cancer. In general, treatment for stomach cancer depends on the following factors:

- Size, location, and extent of the tumour
- Stage of the disease when the cancer is found
- Patient's general state of health

The main and only curative treatment for stomach cancer is surgery. However, chemotherapy and radiotherapy may also be required for some patients. Endoscopic resection may be possible for very early cancers confined to the mucosa. In advanced stage disease, chemotherapy is generally used in combination with surgery, and radiotherapy may also be administered.

An individual with cancer should be assessed by a specialist to determine which treatment is best suited for them.

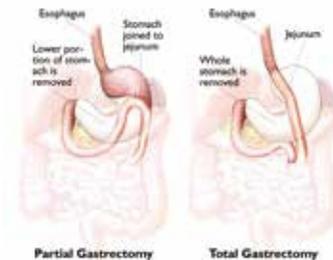
Surgery

The type of surgery for stomach cancer varies based on the stage of the cancer.

- **Upper endoscopy**, which is also used to diagnose stomach cancer, can be used to treat early stomach cancer limited in spread to the stomach's uppermost layers. As a part of this procedure an endoscopic submucosal dissection or endoscopic mucosal resection is performed, and the tumour is resected from the stomach and removed through the mouth.

When the cancer is more advanced, gastrectomy, or removal of the stomach is the recommended surgery.

- **Partial or subtotal gastrectomy** is the removal of a part of the stomach. After a partial gastrectomy, the surgeon will connect the remaining portion of the stomach to the oesophagus or the small intestine, depending on which part of the stomach was removed.
- **Total gastrectomy** is the removal of the entire stomach, suspicious lymph nodes near the stomach and other surrounding tissue. After a total gastrectomy, the surgeon will connect the oesophagus directly to the small intestine.



When stomach cancer has metastasised and spread to the peritoneum, the inner lining of the abdomen, they are known as peritoneal surface malignancies (PSM). In these cases, they may be eligible for a complex and extensive surgery known as **cytoreductive surgery (CRS)** to remove all visible tumour implants within the abdomen. Following CRS, a high concentration of heated chemotherapy is instilled intra-abdominally to eradicate residual microscopic tumour cells, in a procedure called **hyperthermic intraperitoneal chemotherapy (HIPEC)**.

Preparing for surgery

Your surgeon will perform a comprehensive medical work-up including blood tests and scans to see if you are suitable for surgery and advise you on the risks involved.

Before surgery, the anaesthesia team will also assess your fitness for surgery and advise you on various aspects of general anaesthesia and pain control after surgery.

Post-surgery care

Post-surgery, you will be put on an intravenous infusion (drip through a vein) to replace your body's fluids until you are ready for fluids, followed by soft, then solid foods.

After recovering from surgery, you will be given regular outpatient appointments to see your team of doctors. During these appointments, you may have blood tests and scans to check if the cancer recurs.

It is important to follow your doctor's advice, keep to your clinic visits and do the recommended scans, so that timely treatment can be administered if the cancer or other problems occur.

Palliative Surgery and Care

As many advanced cancer patients may not be amenable to cure, palliative surgery or care may be a potential form of treatment. Patients can present with a wide variety of abdominal symptoms owing to tumour related complications such as pain, bleeding, intestinal obstruction, sepsis and jaundice which can substantially decrease their quality of life. Palliative surgery in selected patients has the potential to provide effective relief of symptoms, as can interventions from the supportive and palliative care team to decrease pain and provide comfort.

What are the potential complications of stomach cancer?

If stomach cancer is untreated it can lead to serious symptoms such as gastric outlet obstruction (which can present as intractable vomiting), bleeding from the primary tumour, and accumulation of fluid in the abdomen called ascites, which can lead to increased discomfort from bloating and difficulty to ingest food. Further spread of the disease to liver, lung and bones can also cause organ-specific complications.

If stomach cancer is treated with surgery there are also potential complications, especially if the stomach is removed:

- **Changes in bowel habits** – The body may process food differently, resulting in more frequent bowel movements or difficulty passing motion.
- **A feeling of fullness and change in appetite** – Post-surgery a feeling of fullness may persist, making it difficult to eat full meals. As your stomach capacity and reserves would have changed, this will take some time and months to adjust to and it will slowly regain some normalcy. Small frequent meals are advised.
- **Increased bloating or gas** – Post surgery, a feeling of bloating or gas may persist.
- **Vitamin deficiency** – Nutrition absorption may be impacted, which may lead to conditions such as anaemia. This should be discussed and addressed by your doctor and necessary deficiencies will be appropriately replaced.
- **Dumping syndrome** – The body may not be able to digest sugar and starch properly, which may cause sudden dips in blood pressure. This should be discussed and addressed by your doctor.

Chemotherapy

Chemotherapy is sometimes recommended after surgery if there is a risk that the cancer might return. It may also be used before surgery to shrink the cancer, so that it is more likely to be removed completely during surgery.

In patients with advanced stomach cancer, chemotherapy may be used alone or with targeted drug therapy when resection is no longer meaningful or possible.

Side Effects of Chemotherapy

There are side effects associated with chemotherapy. However, these are temporary and steps can be taken to prevent or reduce them. The possible side effects also depend on which drugs are used. They vary widely from one person to another. Side effects may include:

- nausea and vomiting
- temporary hair loss
- risk of infection due to lowering of white blood cells
- risk of bruising or bleeding due to lowering of platelets count
- lethargy and weakness
- loss of appetite
- mouth ulcers

These side effects usually decrease gradually after treatment is completed. Medication may be prescribed to help relieve some of the discomfort.

Radiotherapy

Radiotherapy uses powerful energy beams to kill cancer cells. It can also be used before surgery to shrink the cancer so that it is more easily removed during surgery. In some instances, the doctor may recommend radiotherapy to reduce the risk of a cancer recurrence after surgery, or in the palliative setting to stop bleeding.

Targeted therapy

Targeted drug treatments work by blocking specific weaknesses present within cancer cells, causing the cancer cells to die. Targeted drug therapy is usually combined with chemotherapy for treating advanced or recurrent stomach cancer.

Immunotherapy

Immunotherapy is a drug treatment that helps a patient's immune system fight cancer. Immunotherapy may be recommended if the stomach cancer is advanced, recurs or spreads to other parts of the body.



Other Information

Can you feel a tumour in your stomach?

In the early stages of the disease, there may not be a palpable mass that can be felt. Only when the mass grows to a significant size, then it can be physically felt. You may start feeling other symptoms of discomfort such as more abdominal bloating, a sensation of fullness or indigestion after taking even small meals before you can actually feel a mass.

Is stomach cancer curable?

Stomach cancer diagnosed in the early stages when it is confined to the stomach as well as regional lymph nodes is curable. Stomach cancer when it has spread to the distant lymph nodes or distant organs such as the lung, liver, peritoneum is no longer curable and treatment given is palliative with aims to control or shrink the tumour, but is unable to eradicate all disease.

What is the prognosis (outlook) for people who have stomach cancer?

There are many factors that influence the prognosis of patients with stomach cancer, such as the location, type and stage of the cancer, as well as the patient's age and overall health. Stomach cancer is usually most treatable when it is found early, before the cancer has spread to other parts of the body.

Is stomach cancer an aggressive cancer?

Yes, stomach cancer can be aggressive, especially in its advanced stages. However, the outlook can vary depending on the stage at which it is diagnosed and other factors.

What is the biggest symptom of stomach cancer?

There is no one biggest symptom of stomach cancer, and it can present any of the following symptoms:

- **Early satiety** – sensation of increasing abdominal bloating or fullness even after a small meal
- **Loss of appetite and loss of weight**
- **Anaemia, bleeding in the stools from the primary tumour**
- **Persistent indigestion or reflux**
- **Nausea or vomiting after a meal**

How long can stomach cancer go undetected?

Stomach cancer can be difficult to detect in its early stages because it often produces no symptoms. As the cancer progresses, the symptoms that appear such as persistent indigestion or upper abdominal discomfort or bloating can be mistaken for normal gastrointestinal issues. Stomach cancer can go undetected for some time before the symptoms become concerning enough for the patient to go for diagnostic testing.

SEXUALITY AND CANCER

Feelings or the emotional effects of cancer may affect patients and their partner in different ways. Many will notice that their interest in sex decrease as a result of cancer or its treatment. They may feel sexually unattractive. These are all very natural feelings. But if you have trouble coping, you may find it helpful to discuss your feelings with a trained counsellor.

Some patients may withdraw due to feelings of being unable to cope with the effects of treatment on themselves or their partner. Others may feel an increased need for sexual and intimate contact for reassurance. Communication is essential in addressing any concerns or problems that may arise. It helps to talk through your feelings with your partner.

In both men and women, chemotherapy drugs can affect fertility. Discuss with your doctor, if this is an issue in your relationship.

In women: chemotherapy can alter hormone production because some of these drugs harm the ovaries. Talk to your doctor about contraception as menstrual cycles may be disrupted but may not fail altogether and you might get pregnant.

In men: chemotherapy is less disruptive. Some find that their sex drive falls, due to tiredness and nausea. But sex drive usually returns after the end of the treatment.



QUESTIONS YOU CAN ASK YOUR DOCTOR

You may find the following list helpful when thinking about of questions you may want 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 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-ups?
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

A diagnosis of cancer often leads to a variety of emotions such as shock, anger, sadness, and possibly even depression. You do not have to struggle with your illness alone. Help is available to support you and your loved ones through your cancer journey. Apart from the team of doctors and health care professionals looking after you, there are other information and support services you may find useful.

Medical Social Services/ Department of Psychosocial Oncology

The Department of Psychosocial Oncology at NCCS comprises a team of Medical Social Workers who are additionally qualified as Clinical Psychologists, Groupwork facilitators, Counsellors, etc. They attend to patients and their families who need emotional support, financial aid, home care, transportation or rehabilitation. You will need a doctor's referral letter link to you with a medical social worker. You may reach the Department of Psychological Oncology at 6306 1777 or psychosocial@nccs.com.sg

NCCS Cancer Helpline

The Cancer Helpline is a private, confidential and anonymous one-to-one information and support service manned by nurses. Their aim is to help you through your cancer experience. They provide information, support on management of treatment side effects, referral to cancer support services and free cancer-related information materials upon request.

The nurses do not give medical advice and treatment recommendations, but may be able to assist you in clarifying your doubts and help in putting into perspective the information you may have received from your doctors. They may be contacted via telephone at 6225 5655 or via email at cancerhelpline@nccs.com.sg



FOLLOW-UP CARE

Follow-up checks may cause anxiety to some. 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 check-ups, 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 in swallowing
4. Unexplained weight loss
5. Fever or cough that does not go away
6. Rashes, bruises, or bleeding
7. Any other signs 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 8000

Singapore General Hospital
Blk 2 Basement 1
Enquiry line : 6436 8000

Useful Contact Details

- Appointment Scheduling Unit : 6436 8088
- General Enquiries : 6436 8000
- Dept of Psychosocial Oncology : 6306 1777
- Outpatient Pharmacy Helpdesk : 6436 8091
- Cancer Helpline : 6225 5655

OTHER RESOURCES ON THE INTERNET

American Cancer Society
www.cancer.org



Macmillan Cancer Support
www.macmillan.org.uk



Cancer Council Victoria
www.cancervic.org.au



National Cancer Institute, USA
www.cancer.gov



National Cancer Centre Singapore
www.nccs.com.sg



Cancer Research UK
www.cancerresearchuk.org



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

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