

# Let's Conquer Cancer



SingHealth

*HEALTHY LIVING SERIES*

# SingHealth Healthy Living Series

The SingHealth Healthy Living Series of booklets aims to bring health information to the public. Our booklets cover a range of medical conditions and are written with the aim of empowering you to take charge of your health by helping you understand your medical conditions and the various treatment options available.

Take the first step in looking after your health.  
Download a copy now!

[www.singhealth.com.sg/shl](http://www.singhealth.com.sg/shl)



## Our booklets in the series are:



**Heart to Heart:**  
All you need to know for better heart health



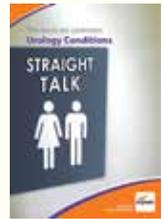
**Bones & Joints:**  
What you need to know



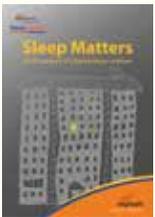
**Eye Check:**  
A look at common eye conditions



**Up Close:**  
Get the answers to common Ear, Nose and Throat conditions



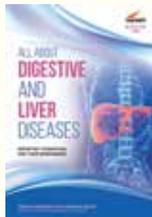
**Straight Talk:**  
The facts on common urology conditions



**Sleep Matters:**  
Get the answers to common sleep conditions



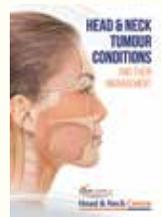
**Stay Healthy:**  
Take the bite out of 20 common health conditions



**All about Digestive and Liver Diseases:**  
Important conditions and their management



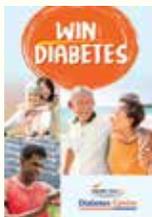
**All Woman:**  
All about common gynaecological conditions



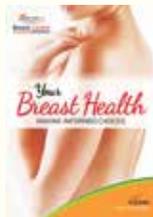
**Head & Neck Tumour Conditions**  
and their management



**Brush Up**  
On what you need to know about common dental conditions



**Win Over Diabetes**



**Your Breast Health:**  
Making Informed Choices

# About SingHealth



SingHealth

**3,700**  
Doctors

**40**  
Medical Specialties

**150**  
Sub-specialties

SingHealth provides tertiary medical care across a comprehensive spectrum of over 40 medical specialties with the in-depth expertise of 150 sub-specialties.

Supported by a faculty of 3,700 doctors and well-equipped with medical diagnostic and treatment technology to provide quality care for our patients, the group has earned a strong reputation for setting standards in healthcare.

As an Academic Medical Centre, we seek to transform patient care by integrating clinical services, teaching and research. Patients at SingHealth enjoy the benefit of treatments with a focus on quality and holistic medical care in an integrated and multidisciplinary setting.



Singapore  
General Hospital



Changi  
General Hospital



Sengkang  
General Hospital



KK Women's and  
Children's Hospital



National Cancer  
Centre Singapore



National Dental  
Centre Singapore



National Heart  
Centre Singapore



National  
Neuroscience Institute



Singapore National  
Eye Centre



SingHealth  
Community Hospitals



Polyclinics  
SingHealth

**PATIENTS. AT THE HEART OF ALL WE DO.®**

# Foreword

Worldwide each year 8.8 million people die from cancer. This is more than the whole population of Singapore! Over the next 10 years, cancer deaths are projected to increase to over 14 million per year.<sup>1</sup>

Cancer is a disease where the older the person is, the more he/she is predisposed to it. Thus, as in our ageing population, the chances of getting cancer will increase as we age. But we can do something to deal with this coming Cancer Tsunami. With a higher public awareness of the disease and early screening, we can pick up cancer earlier and this will make a lot of difference in treatment and survivorship. Cancer treatment has also evolved over the years and survival rates are increasing. Although many still require either long-term treatment or constant monitoring, more cancer patients are living longer with better quality of life. This is only possible through continuous medical research, new technology, as well as the development of palliative and supportive care.

The National Cancer Centre Singapore has always put research at the forefront of our approach to tackling cancer. And we are seeing dividends from our work which have enabled our doctors to better understand the disease, as well as to diagnose and prescribe better treatment for our patients. As a result, I believe we have made good strides in terms of cancer care to give our patients the best hope. The quote from the 19th-century American physician Edward Livingston Trudeau comes to mind. He said: *"We cure sometimes, we relieve often but comfort always."* In the future, with all these research advances, we can probably **"cure often, relieve always and provide comfort at every opportunity we can"**.

There will be an avalanche of cancer in coming years, but as the national centre for cancer we are preparing for this onslaught. We are investing in the equipment and building up our knowledge on how to prevent, detect and treat as best we can. I believe the best way to beat cancer is for all of us – the National Cancer Centre Singapore and each one of you in the community – to work together. Join us, and take charge of your health today.

## **Professor William Hwang**

Chief Executive Officer

National Cancer Centre Singapore

---

<sup>1</sup> *The International Union Against Cancer (UICC) World Cancer Day 2018*

# Contents

04	<b>Facts About Cancer</b>
	<b>Top 10 Common Cancers in Singapore</b>
06	• Breast Cancer
08	• Cervical Cancer
10	• Colorectal Cancer
12	• Liver Cancer
14	• Lung Cancer
16	• Lymphoma
18	• Nasopharyngeal Cancer
20	• Ovarian Cancer
22	• Prostate Cancer
24	• Stomach Cancer
26	<b>Neuro-Oncology</b>
30	<b>Conquering Childhood Cancer</b>
	<b>Screening and Diagnosis</b>
35	Cancer Screening
37	Diagnostic Tests
	<b>Treatment</b>
42	General Modes of Treatment
44	New Cancer Treatments
48	Oncology Services in SingHealth
52	Your Doctor Visit
54	<b>Supportive Care and Other Services at SingHealth</b>
63	<b>Clinical Trials</b>
	<b>More References</b>
64	Internet Resources
66	Glossary
68	<b>Acknowledgements</b>

**Disclaimer:**

All information provided within this publication is intended for general information and is provided on the understanding that no surgical and medical advice or recommendation is being rendered. Please do not disregard the professional advice of your physician.

# FACTS ABOUT CANCER

Cancer is a disease where abnormal cells divide without control and, most times, form a lump (called a tumour) as their numbers increase. Cancer cells can invade nearby tissues and can spread through the bloodstream and lymphatic system to other parts of the body.

---

The majority of cancer cases are sporadic (i.e. the disease is not inherited). Some cases of 'common' cancers such as breast, colon and ovarian cancers can run in a family. Your personal risk depends on factors such as your age, family history of cancer

and your tendency to inherit cancer genes. These are beyond your control. Other risk factors that are within our control are not genetic. These include our lifestyles, diets, smoking and environmental exposures. We must work to reduce or prevent them.

---

In Singapore, **cancer** is currently the **leading cause of death**, accounting for **28.8%** of all deaths in 2018. A total of **71,265** cancer cases were diagnosed between 2013 and 2017. Cancer is a **common disease** and can affect anyone of any age.

---



Non-genetic risk factors for cancer are within your control.

Although great advances have been made in the treatment of cancer, their impact on survival rates has been incremental rather than dramatic. Many cancer patients are also diagnosed relatively late, at which stage their treatment options are often severely limited.

Prevention and early detection of cancer are therefore key strategies in our cancer control efforts. You must be responsible for your own health – only you hold the key to your well-being.



Prevent and detect cancer early.

### Common Cancers in Singapore

#### Top 10 cancers affecting Singapore men

1. Colo-rectum
2. Lung
3. Prostate
4. Liver
5. Lymphoma
6. Non-melanoma Skin
7. Stomach
8. Kidney & other urinary
9. Myeloid Neoplasms
10. Nasopharynx

#### Top 10 cancers affecting Singapore women

1. Breast
2. Colo-rectum
3. Lung
4. Corpus Uteri
5. Ovary
6. Lymphoma
7. Non-melanoma Skin
8. Thyroid
9. Stomach
10. Cervix Uteri

*Extracted from Singapore Cancer Registry 50th Anniversary Monograph (1968 - 2017)  
National Registry of Diseases Office (NRDO).*

# BREAST CANCER

Breast cancer occurs when breast cells become abnormal and divide without control or order. The majority of breast cancers start in the milk ducts.

Breast cancer can spread to the lymph nodes in the underarms and other parts of the body such as the bones, lungs and liver.

---

## Risk Factors

1. Having one or more close relative(s) with breast cancer e.g. mother, sister, aunt or grandmother
2. Personal history of breast cancer
3. Previous breast biopsy showing atypical hyperplasia or lobular carcinoma in-situ
4. Early menstruation (i.e. before the age of 12 years)
5. Late menopause (i.e. after the age of 55 years)
6. Having the first child after the age of 30 years
7. Women on long-term use of combined hormone replacement therapy
8. Regular consumption of alcohol
9. Previous exposure to ionising radiation of the chest at a young age, e.g. radiotherapy to the chest for Hodgkin lymphoma
10. Regular night shift work

## Symptoms

1. A lump or thickening in the breast
2. A change in the size or shape of the breast
3. A change in the colour or feel of the skin of the breast, areola or nipple
4. Bloodstained discharge from the nipple
5. Persistent rash on the nipple and/or areola
6. A recently retracted or inverted nipple

---

**Breast cancer** is the **most common** type of cancer among women in Singapore today.

---

**1 out of every 11** women in Singapore is likely to be afflicted by breast cancer, with more than **2,000** new cases diagnosed annually.

---

## Screening

Screening Test	Who	When
1. Mammography	Women 40-49 years*	Yearly
	Women 50 years and above	2-yearly
2. Breast Self-Examination	Women 30 years and above	Monthly
3. Breast MRI	Women genetically tested to be at high risk of breast cancer	

*\*Women aged 40-49 years should discuss the benefits, limitations and potential harms of screening mammography with their doctors. If screening is decided, this is usually performed annually.*

Breast cancer screening services are available at:

- National Cancer Centre Singapore
- Singapore General Hospital
- Changi General Hospital
- Sengkang General Hospital
- KK Women's and Children's Hospital
- SingHealth Polyclinics

These symptoms may be caused by a number of problems and may not indicate the presence of cancer, but if any of these symptoms persist or are bothering you, do consult your doctor for advice.

## Treatment

Treatment for breast cancer is complex and varies from patient to patient.

Curative treatment would usually include surgery to remove the cancer.

Oncoplastic and reconstructive options are available. Other treatment modalities such as chemotherapy, radiation therapy, targeted therapy and anti-hormone therapy may also be needed.

Every breast cancer patient treated at the SingHealth Duke-NUS Breast Centre is discussed at a multidisciplinary tumour board, and a treatment plan will be recommended by the team of specialists.

For enquiries, contact the SingHealth Duke-NUS Breast Centre at:

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377  
**Changi General Hospital** Tel: 6850 3333

**Sengkang General Hospital** Tel: 6930 6000  
**KK Women's and Children's Hospital** Tel: 6294 4050

# CERVICAL CANCER

The cervix is at the lowest part of the uterus (womb). Cancer of the cervix begins in its lining. There are two main types: squamous cell carcinoma and adenocarcinoma.

---

## Risk Factors

1. Sexual intercourse at an early age
2. Previous infection by the human papillomavirus (HPV)
3. Any medical condition or treatment that affects your immune system (e.g. autoimmune disease, taking long-term steroids)
4. Past diagnosis of pre-cancerous stage – cervical intraepithelial neoplasia (CIN)
5. Smoking
6. History of multiple sexual partners (>2)
7. Other co-infections (e.g. immunosuppression/HIV)

## Symptoms

1. Vaginal bleeding in between periods
2. Bleeding after intercourse
3. Postmenopausal bleeding
4. Foul-smelling vaginal discharge
5. Non-specific pain in the pelvic area
6. Lower back pain

Pre-cancerous (CIN) stage and early cervical cancer (CIS - carcinoma in-situ) usually have no symptoms. Therefore, it is important for women to have regular screenings. All women should go for screenings if they have ever had sex.

---

**Cervical cancer is preventable.** That is why a **regular Pap smear or HPV test** is important as it can detect abnormal cells that may one day become cancerous.

---

**Screening**

Screening Test	Who	When
1. Human Papillomavirus (HPV) test	Women aged 30 years and above who have ever had sex	5-yearly
2. Pap smear	Women aged 25 to 29 years who have ever had sex	3-yearly
	Women who are HIV positive	Yearly (if two initial half-yearly screenings are negative)

Cervical cancer screening services are available at:

- Singapore General Hospital
- Sengkang General Hospital
- KK Women’s and Children’s Hospital
- SingHealth Polyclinics

These symptoms may be caused by a number of problems and may not indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

**Treatment**

Treatment options for cervical cancer include surgery ranging from cryosurgery to hysterectomy, chemotherapy, brachytherapy and radiation therapy.



Brachytherapy: a treatment for cervical cancer.

*For enquiries, contact:*

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Sengkang General Hospital** Tel: 6930 6000  
**KK Women's and Children's Hospital** Tel: 6294 4050

# COLORECTAL CANCER

The lowest portion of the digestive system is the large intestine. It is made up of the colon and rectum. Colorectal cancer is a cancer that develops from the cells of the large intestine and is currently the most common cancer in Singapore.

## Risk Factors

1. A family history of colonic polyps and colorectal cancer
2. Personal history of bowel disease such as ulcerative colitis, especially present for more than 8 -10 years
3. Personal history of bowel disease such as Crohn's disease
4. Personal history of colonic polyps or colorectal cancer previously resected
5. Lifestyle factors such as a high-fat, low-fibre diet, smoking and drinking

## Symptoms

1. A change in bowel habit – persistent diarrhoea or constipation, or alternating diarrhoea and constipation
2. Blood or mucus in the stools
3. Stools that are narrower than usual size
4. Generalised abdominal discomfort – feeling of bloatedness, fullness and cramps
5. Feeling of incomplete emptying of bowels
6. A mass or lump felt in the abdomen
7. Constant tiredness
8. Severe or unexplained weight loss



A family history of colonic polyps and colorectal cancer is a possible risk factor for colorectal cancer.

## Screening

Screening Test	Who	When
1. Faecal Occult Blood Test (FOBT) and Digital Rectal Examination (DRE)	**For average risk individuals 50 years and above	Yearly
2. Sigmoidoscopy		Every 5 years
3. Colonoscopy*		Every 10 years
4. Barium Enema		Every 5 to 10 years
5. CT Colonography	If there are no symptoms, polyps or cancer, or family history	Every 5 to 10 years

*\*For patients who have had a failed or incomplete colonoscopy or those who are deemed to have a moderate risk for colon cancer or would not undergo optical colonoscopy, computed tomographic (CT) colonography can serve as an alternative to colonoscopy.*

*\*\*Individuals with high risk of colorectal cancer will have personalised screening strategies.*

Colorectal cancer screening services are available at:

- National Cancer Centre Singapore
- Singapore General Hospital
- Changi General Hospital
- Sengkang General Hospital
- KK Women's and Children's Hospital
- SingHealth Polyclinics

These symptoms may be caused by a number of problems and may not indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

## Treatment

Treatment options for colorectal cancer include surgery, radiation therapy and chemotherapy.

For enquiries, contact:

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377  
**Changi General Hospital** Tel: 6850 3333

**Sengkang General Hospital** Tel: 6930 6000  
**KK Women's and Children's Hospital** Tel: 6294 4050

# LIVER CANCER

The liver is one of the major organs in the body. It is involved in many processes of the body to keep a person healthy. The liver is made up of many different cell types but the two main ones are liver cells (hepatocytes) and cells lining the bile ducts (cholangiocytes), both of which can undergo changes to form cancer. Most primary liver cancers begin in the hepatocytes.

## Risk Factors

1. Chronic viral hepatitis B and C
2. Non-alcoholic fatty liver disease (NAFLD) and non-alcoholic steato-hepatitis (NASH)
3. Liver cirrhosis (hardening) from any cause
4. Alcoholic liver disease
5. Diabetes mellitus
6. Afla-toxins from a specific fungus in poorly-stored grains/peanuts
7. Family history

**Liver cancer is the 4th most common cancer affecting men in Singapore.**

## Symptoms

*Non-specific*

*(i.e. common to all cancers):*

1. Loss of appetite
2. Loss of weight
3. General tiredness

*Specific to the liver:*

4. Mass in the upper abdomen
5. Distension of the abdominal area
6. Jaundice – yellow discolouration of the skin and eyes
7. Dark tea-coloured urine

These signs usually do not show up until the later stages. These symptoms may be caused by a number of problems and may not indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

Poorly-stored grains/peanuts can be a risk factor for liver cancer.



## Screening

Screening Test	Who	When
1. Alpha-fetoprotein	Routine liver cancer screening is usually performed on patients who have chronic liver disease, especially chronic hepatitis B and C patients	6-monthly
2. Ultrasound examination		6-monthly

## Treatment

Treatment for optimal outcomes in liver cancer depends on:

1. The stage of the disease
2. The underlying function of the liver
3. The general health of the patient

In the early stages, treatment aims for cure through surgery (when liver function is good), or transplantation or radiofrequency ablation (when liver function is poor).

In the intermediate stages, treatment is by loco-regional therapy such as selective internal radiation therapy (SIRT) with yttrium-90 or transarterial embolisation which may shrink the tumour.

In the advanced stages, treatment is with chemotherapy.

As the treatment of liver cancer is complex, the patient should be managed by a multidisciplinary team right from the beginning.



Reduce your alcohol intake to lower your risk.

For enquiries, contact:

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Changi General Hospital**  
**Sengkang General Hospital**

Tel: 6850 3333  
 Tel: 6930 6000

# LUNG CANCER

Lung cancer is the uncontrolled growth of abnormal cells in one or both lungs, usually from the cells that line the air passages or the bronchi. In lung cancer, abnormal cells grow rapidly to form tumours that can interfere with the normal functioning of the lung.

---

Lung cancer can also spread to lymph nodes or other tissues in the chest, including the other lung, and other organs such as the bones, brain and liver.

There are two main types of lung cancer – small cell lung cancer and non-small cell lung cancer. Non-small cell lung cancer is the more common form.

## Risk Factors

1. Cigarette smoking is one of the main causes of lung cancer
2. Passive smoking also increases the risk of lung cancer
3. Exposure to certain chemicals in the environment increases the risk of lung cancer (e.g. asbestos and coal gas)

In Asia, never-smokers with lung cancer are more common than in the West.

## Symptoms

1. Persistent cough that worsens over time
2. Shortness of breath or wheezing
3. Production of bloodstained sputum
4. Chest pain
5. Sudden and unexplained weight loss
6. Loss of appetite
7. General weakness and tiredness
8. Recurrent chest infections and fever

These symptoms may be caused by a number of problems and may not necessarily indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor.

## Screening

Targeted screening through low-dose CT scans of the lungs is recommended for high-risk individuals: adults aged 55 to 80 years who have a 30 pack-year (i.e. a pack a day for 30 years; 2 packs a day for 15 years) smoking history and currently smoke or those who have quit within the past 15 years.

Consult your doctor for a discussion on the risks and benefits of screening if you are a high-risk individual.

## Treatment

Treatment options differ from person to person.

- For patients with lung cancer that is detected early, surgery is recommended to remove the tumour. This may be followed by chemotherapy. Combination chemotherapy and radiotherapy can also treat lung cancer that has not spread to other parts of the body.
- For patients with lung cancer that has already spread beyond the lung, chemotherapy is one option.
- For patients whose lung cancer has specific genetic mutations, targeted therapy using drugs that block these specific mutations are very effective in controlling the cancer.

Immunotherapy, which harnesses the patient's own immune system to fight cancer, has also been shown to benefit certain patients with lung cancer. Participation by patients in clinical trials can help further enhance our understanding of lung cancer, to offer even better therapeutic options in the future.



Smoking is one of the main causes of lung cancer.

For enquiries, contact the SingHealth Duke-NUS Lung Centre at:

**National Cancer Centre Singapore** Tel: 6436 8088  
**National Heart Centre Singapore** Tel: 6704 2000  
**Singapore General Hospital** Tel: 6321 4377

**Changi General Hospital**  
**Sengkang General Hospital**

Tel: 6850 3333  
 Tel: 6930 6000

# LYMPHOMA

The lymphatic system is part of the immune system which defends the body against infection. A fluid called lymph flows through the lymph vessels and it contains white blood cells called lymphocytes. Lymphoma can spread through the lymphatic system to other parts of the body.

---

Lymphoma is a general name for cancer of the tissue of the lymphatic system where there is a large number of abnormal clones of lymphocytes causing swelling of lymph nodes or involvement of other organs. This can disrupt the immune system and reduce a person's ability to fight infections. The lymph nodes can also become swollen, forming painless lumps or tumours.

## Risk Factors

Most lymphoma patients do not have predispositions for developing lymphoma. However, rarely the following factors may increase the risk of a person developing lymphoma:

1. Past diagnosis of certain severe viral infections that suppress your immune system (e.g. the human immunodeficiency virus [HIV] and the Epstein-Barr virus [EBV]). A suppressed or weakened immune system can lead to a higher risk.
2. For the same reason, patients with organ transplants and on immunosuppressive drugs.
3. A history of cancer and prior treatment with chemotherapy or radiation therapy.
4. Frequent exposure to radiation or chemicals such as pesticides, solvents and fertilisers.
5. A family history of lymphoma.

---

The symptoms that **lymphoma patients** can have may be caused by a number of **other unrelated medical problems** and **may not always indicate the presence of cancer**, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

---

## Screening

Screening for lymphoma is currently not recommended.

## Symptoms

1. Painless and enlarged swelling of the lymph nodes in the neck, armpit, groin or abdomen
2. Unexplained fevers
3. Drenching night sweats even in cool weather
4. Unexplained weight loss
5. Patchy red skin and itching without an obvious cause

## Treatment

Treatment options for lymphoma include chemotherapy and radiation therapy.



A family history of lymphoma is a risk factor.

For enquiries, contact the SingHealth Duke-NUS Blood Cancer Centre at:

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Sengkang General Hospital** Tel: 6930 6000  
**KK Women's and Children's Hospital** Tel: 6294 4050

# NASOPHARYNGEAL CANCER

The nasopharynx is an area just behind the nose and above the back of the throat. The cells lining the nasopharynx can become cancerous and give rise to nasopharyngeal cancer (NPC), more commonly known as nose cancer.

## Risk Factors

1. A family history of NPC. Studies have suggested that genetic factors may play a part in NPC.
2. Frequent consumption of preserved food such as salted vegetables, fish and meat.

In a recent Singapore study, these are considered high-risk foods. The cooking of such foods releases toxic substances called nitrosamines into the fumes that we breathe.

3. Epstein-Barr viral infection
4. Smoking

These factors have been found to be associated with, but have not been proven to cause, NPC.



Avoid frequent consumption of preserved food.

---

**Nasopharyngeal cancer** affects men more frequently than women and is the **10th** most common cancer among men in Singapore. It is more common in Chinese and Malay men.

---

## Screening

Screening for NPC is currently not recommended. According to Ministry of Health (MOH) recommendations, people with more than two family members affected by NPC may wish to consult their family doctor to consider blood tests and nasoendoscopy.

## Symptoms

1. A lump in the neck – a swollen lymph node caused by infiltration of cancer cells
2. Nosebleed or bloodstained phlegm
3. Blocking of one or both nostrils
4. Hearing loss or blocked feeling in one or both ears
5. Discharge from the ear
6. Blurred or double vision
7. Hoarseness of voice
8. Difficulty in swallowing
9. Numbness of the affected side of the face
10. Headache



Radiation treatment for NPC.

NPC often does not show any symptoms in the early stages. Some of the signs and symptoms listed may be caused by a number of problems and often do not indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

## Treatment

The treatment for NPC depends on the stage of the cancer when it is diagnosed. In the early stages, it may involve radiation therapy, often in combination with chemotherapy. Surgery is occasionally used for relapses. In the advanced stages, chemotherapy has been shown to be effective in controlling the cancer. We would also encourage patients to take part in clinical trials when available.

For enquiries, contact the SingHealth Duke-NUS Head & Neck Centre at:

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Changi General Hospital**  
**Sengkang General Hospital**

Tel: 6850 3333  
Tel: 6930 6000

# OVARIAN CANCER

The ovaries are part of the female reproductive system. They are found in the pelvic cavity, one on each side of the uterus (womb). Each ovary has an outer covering made up of epithelial cells. Inside the ovaries are germ (primitive) cells which will eventually mature into eggs (ova).

Ovarian cancer occurs when cells grow in an uncontrolled, abnormal manner and produce tumours in one or both ovaries.

## Risk Factors

1. Hereditary factors (e.g. having a personal history of both breast and ovarian cancer; more than two family members with a history of breast or ovarian cancer)
2. Endometriosis
3. Infertility or not having children
4. Early menstruation before the age of 12 years
5. Late menopause

**Ovarian cancer is the 5th most common cancer affecting women in Singapore.**



Ovarian cancer can be hereditary.

## Screening

Screening for ovarian cancer is currently not recommended.

## Symptoms

1. Swelling of the abdomen
2. Abdominal discomfort or bloating
3. Change in bowel habits
4. Rapid or unexplained weight loss

The signs and symptoms of early ovarian cancer are usually non-specific. Sometimes, it may not present with any symptoms. These symptoms may be caused by a number of problems and may not indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

## Treatment

Treatment options for ovarian cancer include surgery and chemotherapy.



Late menopause is a risk factor.

*For enquiries, contact:*

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Sengkang General Hospital** Tel: 6930 6000  
**KK Women's and Children's Hospital** Tel: 6294 4050

# PROSTATE CANCER

The prostate is a small gland located below the bladder and is found only in men. It surrounds the tube that carries urine out from the bladder (known as the urethra).

Prostate cancer develops when the cells in the prostate gland grow too rapidly compared to a normal prostate, forming a malignant or cancerous lump.

Most prostate cancers grow slower than other types of cancers. Advanced prostate cancer can spread to the lymph nodes and bones.

## Risk Factors

1. A family history of prostate cancer (e.g. father, brother, uncle)
2. Age above 50 years
3. Smoking

Men over 50 years have a higher risk of prostate cancer.

**Prostate cancer** is the **3rd** most common cancer affecting men in Singapore.

### Screening

Screening for prostate cancer is currently not recommended, but interested individuals should discuss with their doctor first about the risks and benefits of doing so.

### Symptoms

1. Straining on urination
2. Weak and interrupted urine flow
3. Incomplete voiding
4. Frequent urination during daytime and at night
5. Blood in the urine
6. Blood in the semen
7. Persistent pain of the lower back

Early prostate cancer usually does not have any symptoms.

These symptoms may be caused by a number of problems and may not indicate the presence of cancer, but if any of the above symptoms persist or are bothering you, do consult your doctor for advice.

### Treatment

Treatment options for prostate cancer include surgery, chemotherapy, radiation therapy and/or hormone therapy.



Men over 50 have an increased risk of prostate cancer.

*For enquiries, contact:*

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Changi General Hospital**  
**Sengkang General Hospital**

Tel: 6850 3333  
Tel: 6930 6000

# STOMACH CANCER

The stomach is part of the digestive system. Its role is to receive and break down food, storing and releasing it periodically into the intestine for further digestion. Most stomach cancers develop in the lining of the stomach called the mucosa.

Stomach cancer can grow through the stomach's layers and into organs near it like the liver, pancreas and colon, or it can spread through the lymphatic system or bloodstream to other parts of the body.

## Risk Factors

1. A family history of stomach cancer
2. Chronic *Helicobacter pylori* infection. *Helicobacter pylori* is a bacteria that is sometimes found in the stomach and is associated with increased risk of stomach cancer.
3. Pernicious anaemia – a rare blood disorder
4. Previous stomach surgery with partial removal of the stomach
5. Frequent consumption of preserved or smoked food such as salted vegetables, fish and meat. The cooking of such foods releases toxic substances called nitrosamines which are cancer-causing.
6. Smoking

In Singapore, it is the 7th most common cancer in men and 9th in women.



**Eat healthy.**  
Avoid preserved  
or smoked food.

## Screening

Screening for stomach cancer is currently not recommended.

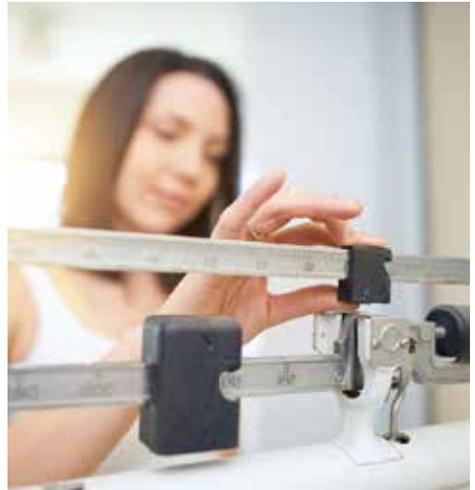
## Symptoms

1. Unexplained weight loss and loss of appetite
2. Discomfort or mild pain over the upper abdomen
3. A sense of fullness or stomach bloating after a small meal
4. Persistent heartburn or indigestion
5. Constant belching, nausea and vomiting
6. Tiredness
7. Blood in the stool
8. Blackish and very foul-smelling stools
9. Pallor

Many of the symptoms of stomach cancer are often ignored as they are often thought to be caused by other less serious conditions. If any of the above symptoms persist or are bothering you, do consult your doctor for advice.

## Treatment

Treatment options for stomach cancer include surgery ranging from endoscopic mucosal resection to gastrectomy, chemotherapy or radiation therapy.



Symptoms of stomach cancer are often ignored as they are often thought to be caused by other less serious conditions.

*For enquiries, contact:*

**National Cancer Centre Singapore** Tel: 6436 8088  
**Singapore General Hospital** Tel: 6321 4377

**Changi General Hospital**  
**Sengkang General Hospital**

Tel: 6850 3333  
Tel: 6930 6000

# NEURO-ONCOLOGY

Neuro-oncology refers to the treatment of patients with primary brain tumours and patients with neurologic complications that may arise from systemic cancers or through the treatment process.

The National Neuroscience Institute (NNI) Neuro-Oncology Programme provides comprehensive treatment for patients with brain and central nervous system tumours.

NNI has a team of specialists in the fields of neurosurgery, neuroanaesthesia, neuro-oncology, radiation oncology, neuropathology, neuroradiology, neuro-ophthalmology, endocrinology and other subspecialties at its campuses at Tan Tock Seng Hospital (TTSH) and Singapore General Hospital (SGH), which includes the National Cancer Centre Singapore (NCCS).

NNI also manages paediatric neuro-oncology cases at KK Women's and Children's Hospital (KKH) as part of a multidisciplinary team under the VIVA-KKH Paediatric Brain and Solid Tumour Programme.

The focus is on providing quality patient care using advances driven by scientific and clinical discoveries.

NNI adopts a multidisciplinary approach to ensure both efficiency in diagnosing and treating patients as well as the development of a treatment plan

tailored to each patient's needs. The programme offers up-to-date advances in diagnostic tools, surgical techniques, and medical and radiation therapies. These include:

- Neurosurgical technologies including 3D navigation systems and intraoperative magnetic resonance imaging (MRI) technology
- Awake craniotomy for maximal resection of tumours in critical brain locations



Source: The Straits Times © Singapore Press Holdings Limited. Permission required for reproduction.

- Minimally-invasive transphenoidal surgery for pituitary tumours and selected skull base tumours
- Specialised neuro-critical care units with monitoring for postoperative care
- Radiation therapy technologies that allow for the accurate delivery of radiation in an effort to spare normal brain tissue from the impact of radiation treatment. These include intensity-modulated radiation therapy (IMRT) which allows physicians to manipulate radiation beams to the shape of a tumour, and stereotactic radiosurgery which focuses precise beams of radiation directly to a tumour.
- Ready access to the allied health services for inpatient and outpatient neuro-rehabilitation, psychological and social support to help patients and families throughout the pre- and post- treatment course

### WHAT ARE BRAIN TUMOURS?

A brain tumour is an abnormal growth of cells inside the skull.

**Primary brain tumours** are tumours which arise from the brain. They can grow from the cells of the brain, blood vessels in the brain, nerves that emerge from the brain or the membranes covering the brain. Benign (non-cancerous) brain tumours are generally slow-growing tumours. They can exert potentially damaging pressure on the

brain but they do not spread into the surrounding brain tissue. Malignant (cancerous) brain tumours are rapid-growing and they spread into the surrounding brain.

**Secondary or metastatic brain tumours** grow from cancer cells that originate from a primary cancer located in another organ (e.g. lung, breast or colon).

Both primary and secondary brain tumours can result in severe disability and can cause death if the growth is left unchecked. All patients with symptoms of a possible brain tumour should be evaluated by a neurosurgeon for diagnosis and treatment.

The common brain tumours encountered include:

- Meningioma
- Pituitary tumour
- Glioma
- Metastatic tumour

### CAUSES

A few genetically inherited diseases have been identified that can increase the risk of the development of brain tumours. Research has shown identifiable genetic abnormalities in some brain tumours. Some tumours are also known to have an increased incidence in certain families. However, in the vast majority of cases, the cause

of brain tumours is unknown. There is at present, no clear evidence that injury, chemical exposure, viral infection, mobile phone use, environmental factors or mental stress can cause the growth of brain tumours.

## SYMPTOMS

The symptoms may be generalised or localised.

**Generalised symptoms** are due to increased pressure exerted on the brain and include:

- A recurring headache that is at its worst in the morning
- Nausea and vomiting
- Seizures
- Increased drowsiness

**Localised symptoms** depend on the location of the tumour and include:

- Progressive weakness or numbness in the arms or legs
- Progressive difficulty with speech, hearing, concentration or vision, including double-vision
- Memory loss or a change in memory
- A significant change in personality or behaviour

Some of these symptoms may also be caused by other conditions besides brain tumours. It is therefore wise to seek a neurosurgical opinion should the symptoms persist.

## DIAGNOSIS

### How are brain tumours diagnosed?

A detailed clinical assessment including history of the symptoms and a physical examination, including a comprehensive neurological examination, is necessary.

Specialised imaging tests such as computed tomography (CT scan) and MRI will usually be performed. Occasionally, special tests like cerebral angiogram (x-rays of the blood vessels of the brain), functional MRI scans and MRI tractography may be required as preoperative work-up.

These tests will reveal the tumour's size, location and also proximity to critical structures such as the speech or motor areas of the brain. The information will provide the neurosurgeon with a tentative diagnosis of the type of tumour and aid in planning the surgical approach for its removal.

## TREATMENT

Treatment for brain tumours may involve one or more of the three modalities of surgery, radiation therapy and chemotherapy.

### Surgery

In most cases, surgery using microsurgical techniques is required to remove as much tumour as possible while minimising injury to the brain. Use of a computerised navigation system allows the neurosurgeon to

localise the tumour accurately and also to navigate around critical areas of the brain.

Under special circumstances when the tumour is located in critical areas of the brain, an awake surgery may even be done with the patient under mild sedation. The critical areas can be identified by stimulating the areas with a small electrical current and tumour removal is performed with constant monitoring of the patient's speech or limb strength. The overall aim is to remove as much tumour as possible with least damage to the critical areas.

When the brain tumour is small and deep-seated, more extensive tumour removal may not be possible. In such situations, stereotactic MRI-guided biopsy is performed. A small piece of tumour is taken and sent for diagnostic investigations.

### Radiation Therapy

For primary cancerous brain tumours that cannot be completely removed, surgery may be followed by external

beam radiation delivered by a linear accelerator over two to six weeks to destroy the remaining tumour cells.

### Chemotherapy

Drugs that destroy or slow down the growth of tumour cells can be administered either orally or by intravenous injection.



A recurring headache that is at its worst in the morning may be a symptom of brain tumours.

*For enquiries, contact:*

**National Neuroscience Institute**

Tel: 6321 4377 (SGH Campus)

Tel: 6330 6363 (TTSH Campus)

**KK Women's and Children Hospital** Tel: 6294 4050

# CONQUERING CHILDHOOD CANCER

## Some Facts about Childhood Cancer

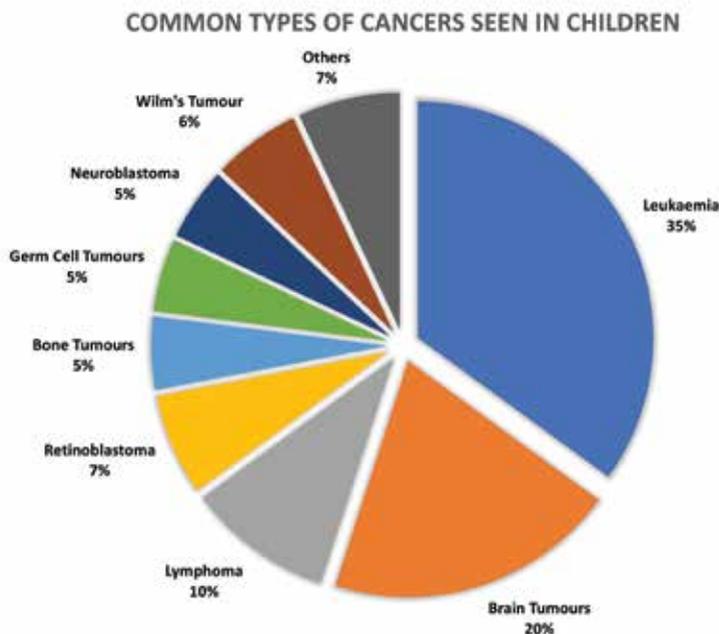
In Singapore, about 120 new cases of childhood cancers are diagnosed in children who are less than 15 years of age each year. The most common types of cancers seen in children are listed in the chart below.

With advances in the understanding of cancer biology, intensive multi-agent drug therapy, and applying therapies such as targeted therapies, haematopoietic stem cell transplant, other cellular therapies and cancer immunotherapy, childhood cancers are highly curable today.

For common cancers, including leukaemia, lymphoma, germ cell tumour and Wilm's tumour, the cure rates are 90 percent. Brain and bone cancers are moderately curable, at 60 percent.

Although some children may have genetic conditions that predispose them to developing tumours, the exact causes of cancer in the majority of children are unknown.

It is also important to remember that cancer is not contagious.



### *Signs and Symptoms of Childhood Cancer*

Some signs and symptoms of common childhood cancers are highlighted below:

#### **Leukaemia**

Leukaemia is a cancer of white blood cells, and is the most common childhood cancer. Leukaemia cells are often referred to as blast cells.

As many blast cells are being produced in the marrow, the marrow is not able to produce enough normal blood cells. As a result, there is not enough normal white blood cells to fight infection, not enough red blood cells to carry oxygen, and not enough platelets to help stop bleeding.

Therefore, the symptoms of leukaemia include recurrent or prolonged fevers, loss of energy and appetite, pallor (pale-ness), easy bruising or mucosal bleeding, and bone pain.

#### **Brain Tumours**

Brain tumours are also a common childhood cancer, with incidence second only to leukaemia. Symptoms will vary, depending on the location and size of the tumour and the age of the child.

In a young baby, the head may rapidly increase in size.

Older children may have headaches, vomiting and drowsiness, due to increased pressure on the brain by the growing tumour. The child may develop weakness, unsteadiness when walking, clumsiness, double vision and squinting

if certain parts of the brain are affected by the tumour.

#### **Lymphoma**

These are tumours that start in the lymph glands.

Symptoms include swellings in the neck, armpit, groin, chest and abdomen, which are where the lymph glands are located. There may also be recurrent fevers, pallor (paleness), and a loss of weight and appetite.

#### **Retinoblastoma**

This is a cancer of the eye, and usually occurs in very young children under two years of age.

Early symptoms include white eye reflex, squinting, or a white mass seen through the lens of the eye.

#### **Wilm's Tumour**

This is a cancer occurring in the kidney. The child usually presents with a swelling in the abdomen, which may be painful. Occasionally, the child may pass blood in the urine.

### *Treatment Options for Childhood Cancer*

The treatment options available will depend on the type of cancer being treated.

For example, surgery is usually necessary for solid tumours, but chemotherapy is the treatment of choice for leukaemia, because the cancer cells are already present in the blood circulating throughout the body.

## **Surgery**

Surgery is required for most solid tumours. However, if the initial position or size of the tumour makes the operation a high-risk procedure, chemotherapy or radiotherapy may first be given to reduce the size of the tumour.

## **Radiation Therapy**

Radiation destroys cancer cells by injuring their ability to divide. A special equipment directs rays to the tumour site for a few minutes at a time. This is done five times a week, for two to six weeks, depending on the type of tumour. Side effects include skin irritation and pigmentation, which are usually temporary.

## **Chemotherapy**

This involves the use of drugs that interfere with cell division and stop the growth of tumour cells. They circulate throughout the body and can kill cancer cells far away from the original tumour site.

This is the mainstay of leukaemia therapy. Some chemotherapy drugs are given by injection, while others can be taken orally.

Side effects include hair loss, nausea and vomiting, a loss of appetite, mouth ulcers and an increased risk of infection. However, steps can be taken to prevent or reduce them.

## **Haematopoietic Stem Cell Transplantation and Cancer Immunotherapies**

Traditionally, the bone marrow is a

source of haematopoietic stem cells and is the basis of bone marrow transplantation, a form of treatment for childhood cancers. However, peripheral blood and cord blood are alternative sources of haematopoietic stem cells, which give rise to treatment methods such as the haematopoietic stem cell transplantation (HSCT) and other forms of cancer immunotherapies.

At KK Women's and Children's Hospital (KKH), several types of HSCT are offered to children with cancer. In allogeneic HSCT, the stem cells can be from a matched family donor, usually a sibling, or from a matched unrelated donor. In autologous HSCT, the patient's own stem cells are used. Recent advances in stem cell transplant technology have also made haploidentical HSCT possible, where a partially-matched related donor can be considered when no matched donors are available.

HSCT is used mainly for high-risk leukaemia or relapsed leukaemia, but can also be used to treat other types of cancers, such as high-risk neuroblastoma, as well as non-malignant conditions such as blood disorders or immune disorders.

When undergoing a HSCT to treat cancers, high doses of chemotherapy, with or without radiotherapy, are usually given to a patient to kill the cancer cells. However, normal blood stem cells are also destroyed by the intensive treatment. As such, healthy blood stem cells from a donor are transplanted into the body to replace

the destroyed normal cells. These donor stem cells may sometimes also have a cancer-killing effect.

In addition, cancer immunotherapy is an emerging field that involves the use of components of the immune system to fight cancer. Examples of cancer immunotherapies are:

- Using antibodies to target certain cancers, such as using the anti-GD2 antibodies for neuroblastoma
- Using checkpoint inhibitors that release 'brakes' in the immune system, and therefore allow immune killing of cancer cells
- Cellular immunotherapies such as the CART-cell therapy that manipulate and redirect immune cells to kill specific cancers; or viral-specific T-cells to treat viral infections, especially in immunocompromised patients, that may not respond to conventional therapies

These complex therapies require a clean and safe environment to reduce the risk of serious infections. At KKH, the multidisciplinary medical team monitors and manages complications that may arise in the paediatric patient from these therapies.

### *The Children's Cancer Programme at KK Women's and Children's Hospital*

The Children's Cancer Centre in KKH offers a holistic and comprehensive range of services to treat children with cancer, as well as to support the emotional needs of their families.

The centre is managed by a multi-disciplinary team that consists of paediatric oncologists, paediatric neurosurgeons, paediatric oncology surgeons, anaesthetists, pathologists and pharmacists along with oncology-trained nurses.

The inpatient ward has 33 beds, including 12 Bone Marrow Transplant rooms, manned by a dedicated team of doctors and nurses trained in the care of children with cancer.

There is also a 13-bed Day Therapy Centre for outpatient treatment, and a dedicated oncology pharmacy which dispenses oncology drugs.

The team works closely with social workers from the hospital and the Children's Cancer Foundation (CCF) to offer psychosocial support to patients and their families.

The diagnosis of cancer in a child is always a devastating one for both the child and family. The care team at KKH hopes to work together with both parties to achieve the common goal of conquering childhood cancer.

### *VIVA-KKH Paediatric Brain and Solid Tumour Programme*

Brain and solid tumours comprise a large proportion of childhood tumours that are treated at KKH. The VIVA-KKH Paediatric Brain and Solid Tumour Programme is a collaborative clinical and research partnership between VIVA Foundation for Children with Cancer, KKH and St. Jude Children's Research

Hospital for childhood brain and solid tumours.

The programme was established in 2015 to seek advancements through improving clinical care and bench-to-bedside translational clinical research for childhood brain and solid cancers, and the prevention, control and population-based science and education about these cancers.

The team leading the programme takes on a multidisciplinary approach to ensure efficiency in diagnosing and treating patients, and developing an optimal treatment plan for each patient.

### **CCF Paediatric Oncology Survivorship Programme**

Funded by Children's Cancer Foundation (CCF), the CCF Paediatric Oncology Survivorship Programme was established in 2016 with the aims to better coordinate and standardise survivorship care for paediatric cancer survivors at KKH, and extend the work of the Singapore Childhood Cancer Registry (SCCR) to include a late effects database for audits and research. Under this programme, paediatric patients who have been diagnosed with cancer for more than five years are eligible to attend a late effects long-term follow-up clinic.

The purpose of the clinic is to facilitate surveillance, prevention and implementation of early intervention for late effects that may surface in a paediatric patient with cancer, through individualised care

plans and evidence-based guidelines. The empowerment of survivors will help them to lead healthy, independent and productive lives beyond their cancer treatment.

The clinic sessions are currently held weekly with a paediatric oncologist, a resource nurse, as well as social workers from the hospital and from CCF. The team also collaborates with other specialties (endocrinology, reproductive medicine, adult medicine/specialties, neuropsychology, allied healthcare, medical social workers, etc.) to provide holistic multi-disciplinary care for this group of patients.

### **Singapore Childhood Cancer Registry**

The SCCR was established in 1999 under the auspices of the Paediatric Oncology Group, Singapore (POGS) with the aim of studying the epidemiology of childhood cancers within a multiracial Asian population.

The registry has been systematically collecting information on cancers in children and adolescents diagnosed and/or treated in Singapore since 1997.

A total of over 3,700 cancer cases have been registered with the SCCR, with a majority of childhood cases (aged 0 to 14 years) seen by the paediatric haematology/oncology services at KKH and National University Hospital. The SCCR has been providing support for several studies and clinical trials over the years.

*For enquiries, contact:*

**KK Women's and Children's Hospital** Tel: 6294 4050

# CANCER SCREENING

Screening can help detect a cancer in its early stages for effective treatment. Likewise, coming forward for early detection and treatment can improve the chances of cure. About one-third of cancers can be cured.

The tables below show the four types of cancer where screening is recommended and has been proven to be effective.

Cancer Type	Screening Test	Who	When
Breast	1. Mammography	Women 40-49 years*	Yearly
		Women 50 years and above	2-yearly
	2. Breast Self-Examination	Women 30 years and above	Monthly
	3. Breast MRI	Women genetically tested to be at high risk of breast cancer	

*\*Women aged 40-49 years should discuss the benefits, limitations and potential harms of screening mammography with their doctors. If screening is decided, this is usually performed annually.*

Cancer Type	Screening Test	Who	When
Cervical	1. Human Papillomavirus (HPV) test	Women aged 30 years and above who have ever had sex	5-yearly
	2. Pap smear	Women aged 25 to 29 years who have ever had sex	3-yearly
		Women who are HIV positive	Yearly (if two initial half-yearly screenings are negative)

Cancer Type	Screening Test	Who	When
Colorectal	1. Faecal Occult Blood Test (FOBT) and Digital Rectal Examination (DRE)	**For average risk individuals 50 years and above	Yearly
	2. Sigmoidoscopy		Every 5 years
	3. Colonoscopy*		Every 10 years
	4. Barium Enema		Every 5 to 10 years
	5. CT Colonography	If there are no symptoms, polyps or cancer, or family history	Every 5 to 10 years

*\*For patients who have had a failed or incomplete colonoscopy or those who are deemed to have a moderate risk for colon cancer or would not undergo optical colonoscopy, computed tomographic (CT) colonography can serve as an alternative to colonoscopy.*

*\*\*Individuals with high risk of colorectal cancer will have personalised screening strategies.*

Cancer Type	Screening Test	Who	When
Liver	1. Alpha-fetoprotein	Routine liver cancer screening is usually performed on patients who have chronic liver disease, especially chronic hepatitis B and C patients	6-monthly
	2. Ultrasound examination		6-monthly

# DIAGNOSTIC TESTS

Diagnostic Test	Description
Barium Enema Radiological Examination	This procedure uses barium and air to outline the lining of the rectum and colon. The barium is given in an enema (injection of a liquid through the anus) which is then 'held' inside the colon while x-rays are taken.
Barium Meal Radiological Examination	During this examination, the patient swallows liquid containing barium. X-rays are then taken to delineate the stomach wall.
Bronchoscopy	In this examination, a fibre-optic tube about 7mm in diameter is introduced through the nose and into the lung under light sedation and local anaesthesia. Small pieces of tissue can be painlessly removed for further examination to diagnose cancer.  <i>This procedure is specific for lung cancer.</i>
Colonoscopy	A flexible fibre-optic scope is introduced via the anus to examine the inner covering mucosa of the entire large intestine. This technique can effectively detect very early cancers and precursor polyps as well as any other pathology (e.g. infection, inflammation, diverticular disease).
Colposcopy	A specialised examination with a binocular microscope to assess the cervix when a woman has an abnormal Pap smear, or when the cervix appears suspicious of having a cancer on clinical examination. Colposcopy can detect infection by human papilloma virus (HPV), pre-cancer, and cancer of the cervix, vagina and external genitals (vulva). Suspicious lesions will be biopsied.

Diagnostic Test	Description
Computed Tomography (CT)	This test uses a special x-ray machine that takes pictures from many angles. A computer to produce detailed cross-sectional images combines the pictures. The CT scan can help show if and where the cancer has spread.
Computed Tomographic (CT) Colonography	<p>CT colonography, also known as 'virtual colonoscopy', is an imaging technique of the colon involving multi-slice CT and computer software to generate high-resolution two-dimensional and three-dimensional images of the inner surface of the colon. These images are then interpreted by a radiologist to determine the presence of several types of abnormalities of the colon.</p> <p>CT colonography has been investigated as a technique for colon cancer screening. Although it requires a full bowel cleansing similar to that required for conventional colonoscopy, the procedure requires no sedation or analgesia, and is faster to perform than conventional colonoscopy. However, since it is only a screening procedure, patients with positive findings require conventional colonoscopy for biopsy of the lesion.</p>
Flexible Sigmoidoscopy	A tube is inserted into the rectum and guided into the sigmoid colon to examine the lining of the lower end of the large intestine. This procedure only covers the left-sided colon.
Gastroscopy	This is an examination of the inside of the gullet, stomach and duodenum. It is performed by using a thin flexible fibre-optic scope that is passed through the mouth and allows the doctors to examine the lining of the oesophagus (gullet) or stomach and take a biopsy.

Diagnostic Test	Description
Magnetic Resonance Imaging (MRI)	<p>MRI scans use radio waves and strong magnets instead of x-ray. The energy from the radio waves is absorbed and then released in a pattern formed by the type of tissue and by certain diseases. A computer translates the pattern of radio waves given off by the tissues into a very detailed image of parts of the body.</p> <p>Not only does this produce cross-sectional slices of the body like a CT scanner, it can also produce slices that are parallel with the length of the body.</p>
Oesophago-Gastro-Duodenoscopy (OGD)	<p>A thin tube containing a tiny camera is passed down your throat and into your stomach. The doctor will take a small piece of tissue from your stomach to look at under a microscope for signs of cancer cells if any abnormalities are found.</p>
Peritoneal Fluid Cytology	<p>Fluid may be removed from the abdominal cavity and sent for testing to detect the presence of cancerous cells.</p>
Positron Emission Tomography (PET)	<p>A type of scan that can actually see how body tissues and organs are working and not just what they look like. PET images show the chemical changes of an organ or tissue, unlike x-ray, CT or MRI, which show only body structure.</p> <p>PET uses special 'radioactive tracers', which help to reveal more about the biochemical activity at the cellular level of a disease than other types of imaging techniques.</p>
Serum Prostate-Specific Antigen (PSA)	<p>PSA is a protein produced by normal, as well as malignant, cells of the prostate gland. This test measures the level of PSA in a man's blood. For this test, a blood sample is sent to a laboratory for analysis.</p>

Doctors may order one or a range of diagnostic tests to diagnose any breast concerns. Below are **tests that are specific to breast diseases**. If there is suspicion of cancer, a biopsy is usually undertaken to confirm the diagnosis and determine the type of breast cancer.

In addition, doctors may also order a range of tests to determine the extent and spread, if any, of the cancer (e.g. CT scans, whole body bone scintigraphy scans, and/or PET scans).

Diagnostic Test	Description
Mammography	<p>A mammogram is a breast x-ray. Each breast is x-rayed twice – once from the top down, and once from side to side. To allow for better visualisation, the breast is compressed between two plastic panels. This may be uncomfortable, but it lasts only a few seconds.</p> <p>The mammogram detects microcalcifications, distortions, densities and masses. It may be complemented by a breast ultrasound. Mammography is the only screening tool shown to be effective in reducing the risk of dying from breast cancer.</p>
3D Mammography (Tomosynthesis)	<p>This is an x-ray examination of the breast similar to digital mammography, except that it provides three-dimensional images that can help in better visualising areas of breast that are dense, which may obscure subtle cancerous changes in the breast. This mammography examination is hence mainly considered in patients with dense breasts.</p>

Diagnostic Test	Description
Breast and Axillary Ultrasonography	<p>This test uses ultrasound waves to aid in the diagnosis of breast lumps in conjunction with mammography. It can determine if a lump is mainly solid or cystic, i.e. liquid filled. It is also used to detect the possibility of the spread of breast cancers to the local lymph nodes in the axilla (armpit).</p> <p>The test involves an ultrasonography operator (or doctor) obtaining images by placing a handheld device (ultrasound probe) over the area of concern (e.g. breast and/or armpit).</p>
Core Needle Biopsy	<p>Needles may be used to remove tissue from the breast for microscopic examination (biopsy). These needles are hollow, and may be vacuum assisted (mammotome) or springloaded (trucut).</p> <p>The needle is guided precisely to the area of interest by ultrasound, mammography or MRI. This procedure is minimally invasive and performed under local anaesthesia. It is a day surgery procedure.</p>

# GENERAL MODES OF TREATMENT

## Pathologic Diagnosis of Cancer

The diagnosis of cancer requires the taking of a tissue sample so that it can be processed for examination under the microscope by a pathologist for confirmation of cancer.

---

The type and grade of the cancer can also be determined on microscope examination. The tissue sample can be obtained through a biopsy or fine needle aspiration procedure, which involves either the removal of a small amount of tissue, or aspirating cells from the lump, for histologic evaluation.

**Surgery** is the most effective treatment for a solid tumour when it is operable. However, every person is different and needs an individual treatment plan. The treatment plan depends on the type, location, size, stage and grade of cancer.

During surgery, the surgeon removes the section of the tissue that is affected. Nearby lymph glands will also be removed because if the cancer has spread, it usually spreads first to the lymph glands.

**Chemotherapy** is the use of anti-cancer drugs to kill cancer cells. They stop cancer cells from growing and reproducing themselves. These drugs can be given orally or by injections. The drugs enter the bloodstream and travel throughout the body. Drugs may be used alone, before or after surgery, or



Every person is different and needs an individual treatment plan.

together with radiation therapy to increase the effectiveness of treatment.

Chemotherapy is given in cycles. Each cycle consists of a treatment period followed by a resting (recovery) period. As cancer drugs also affect normal cells, the resting period is to allow the body to recover before the next treatment cycle starts.

There are side effects associated with chemotherapy such as hair loss, nausea and vomiting, loss of appetite, mouth ulcers and risks of infection. However, these are temporary and steps can be taken to prevent or reduce them.

**Radiation therapy** uses radiation to kill cancer cells or stop them from growing further. Although radiation therapy can affect both cancer cells as well as normal cells, the aim of radiation is to destroy more cancer cells and spare as many normal cells as possible.

The two ways of delivering radiation are using external beam and brachytherapy.

In external beam radiotherapy, machines called linear accelerators (linacs) produce high energy x-rays that are used for treatment. In contrast, radioactive sources are applied in close contact to the tumour for treatment in brachytherapy.

Radiation therapy can cause side effects, which vary between individuals and different treatment sites. For example, treatment of the head and neck region may cause dryness of mouth or painful swallowing, whereas patients receiving treatment to the abdominal area may experience diarrhoea. Most of these side effects are temporary and are manageable. Newer radiotherapy techniques can minimise these side effects.

**Hormone therapy or endocrine manipulation** aims to control a cancer by changing the hormonal environment in which it is growing.

A hormone is a substance which has specific effect on the way the body works. Made in very small amounts by glands, various hormones help to regulate and coordinate growth, metabolism and reproduction. They are distributed in the bloodstream. Cancer of the breast or prostate, for example, can respond well to hormone treatment.

# NEW CANCER TREATMENTS

## Immunotherapy

Our immune system works to protect the body against infection, illness and disease. It can also protect us from the development of cancer.

The immune system includes the lymph glands, spleen and white blood cells. Normally, it can spot and destroy faulty cells in the body, stopping cancer from developing. But a cancer might develop when:

- The immune system recognises cancer cells but it is not strong enough to kill the cancer cells
- The cancer cells produce signals that stop the immune system from attacking them
- The cancer cells hide or escape from the immune system

Immunotherapy strategies aim to overcome these changes.

A valuable characteristic of immunotherapy is its potential ability to specifically target cancer cells and spare normal organs, thus these patients usually do not get the typical side effects associated with chemotherapy.

Another beneficial feature is the ability of immunotherapy to potentially induce 'immunological memory' against cancer, and some patients have been reported to have durable longer-term survival compared to patients treated with other cancer treatment strategies.

Standard immunotherapy, as well as those available through clinical trials, are vital treatment options against some cancers.

## Intensity Modulated Radiotherapy

Intensity modulated radiation therapy (IMRT) is a mode of high-precision radiotherapy that utilises computer controlled x-ray to deliver radiation that conforms to the three-dimensional (3D) shape of the tumour by controlling the intensity of the radiation beam.

This allows a high radiation dose to be delivered to the tumour while minimising radiation of the surrounding normal tissues. IMRT also has the capability of 'dose-painting', a technique where different doses can be delivered to different parts of the treated volume.

## Volumetric Modulated Arc Therapy

Volumetric modulated arc therapy (VMAT) is a form of IMRT that delivers an accurately sculpted 3D dose distribution as the radiotherapy machine rotates around the patient during treatment. The machine continuously reshapes and changes the intensity of the radiation beam as it rotates around the body.

VMAT enables the accurate delivery of a high, targeted dose of radiation

with minimal damage to surrounding structures and organs. VMAT also has the added advantage of reducing radiation treatment time compared to conventional IMRT.

VMAT is especially useful in cases where normal organs are in close proximity to the tumour. In head and neck cancers for example, tumours often sit next to vital organs such as nerves to the eyes, spinal cord and salivary glands.

VMAT allows radiation oncologists to minimise dosage to these critical organs while keeping the dose to the tumour sufficiently high to ensure cure.

### **Interstitial Brachytherapy**

Interstitial brachytherapy is a form of internal radiation therapy that uses radioactive sources placed into or near a cancer tumour. In comparison to external beam radiation therapy, brachytherapy delivers a higher dose of radiation to specific sites in the body because this technique targets the tumour and minimises radiation to the surrounding healthy tissue.

Interstitial brachytherapy is performed under image-guidance using a combination of ultrasound, CT and/or MRI. Image-guided brachytherapy combines imaging techniques with brachytherapy procedures, allowing for precision in patient treatment. Interstitial brachytherapy is currently used in the treatment of cervical and prostate cancer.

Interstitial Brachytherapy is particularly useful in the treatment of locally advanced cervical cancer as it enables the delivery of high dose radiation to the tumour.

### **Stereotactic Radiosurgery (Novalis)**

Radiosurgery refers to the use of small beamlets of ionising radiation to remove intracranial lesions which were previously classified as 'inoperable' or as an alternative to open neurosurgery.

Radiosurgery offers a non-invasive alternative for many patients for whom traditional brain surgery is not an option, and removes the physical trauma and majority of risks associated with conventional surgery.

This procedure has the advantage of requiring no hospitalisation or ICU stay, no general anaesthesia (except in young children), and reduced treatment mortality (from haemorrhage or infection) for most indications compared to conventional open neurosurgery.

### **Tomotherapy**

Literally meaning slice treatment, this machine looks similar to a CT scanner but spews out thin-slice high-energy x-rays. Like IMRT, this treatment allows highly conformal radiation to be delivered to the tumour, at the same time sparing normal organs.

The added advantages of this modality are the ability for imaging to be done prior to each treatment to ensure accurate positioning as well as its ability to treat a large area in one sitting.

### ■ *Molecular Targeted Therapy*

It refers to a group of drugs that specifically target cancer cells, leaving the other cells unharmed; hence they

are regarded as 'Magic Bullets'. Since these drugs only target cancer cells, they are usually thought to be free of side effects.

However, this is not true. There are different types of side effects, depending on the kind of drug taken. It is also important to note that every individual's experience with side effects may differ.



Immunotherapy has the potential ability to specifically target cancer cells, and spares normal organs.

### ■ *Interventional Radiology*

This plays a large role in treating hepatic (liver) malignancies that cannot be removed. It is important to stress that these treatments are palliative, and not for curative intent. There are two interventional techniques.

The first is **transarterial chemo-embolisation (TACE)** which combines hepatic artery embolisation with simultaneous infusion of a concentrated dose of chemotherapeutic drugs.

Embolisation deprives the tumour of blood supply and promotes tumour cell death.

The second is **radiofrequency ablation (RFA)** of liver tumours. RFA uses the principle of microwaves to generate heat within the target tissue. It does not distinguish between tumour and normal tissue. The needle is placed into the lesion under imaging guidance. Both CT and ultrasound work well for this technique.

# ONCOLOGY SERVICES IN SINGHEALTH

## Cancer Screening Services

What	Where	Contact No.
<b>Health Screening</b> <ul style="list-style-type: none"> <li>• General</li> <li>• Specific</li> </ul>	<b>Singapore General Hospital</b> Health Assessment Centre, Camden Medical Centre	6736 6180
<b>Breast Screening</b> <ul style="list-style-type: none"> <li>• Screening Mammogram (Breast Screen Singapore) <i>Available at selected SingHealth polyclinics*, call Breast Screen Singapore Hotline for an appointment.</i></li> <li>• Diagnostic Mammogram <i>Available at selected SingHealth polyclinics*, call respective polyclinics for an appointment. Requires a valid Lab Order Form from either a GP or polyclinic doctor.</i></li> </ul>	<b>SingHealth Polyclinics</b>  Bedok* Bukit Merah* Outram* Pasir Ris* Punggol* Tampines*	<b>Breast Screen Singapore Hotline:</b> 6536 6000  6202 1048 6350 7413 6350 7395 6350 7332 6718 2094 6350 7347
<b>Cervical Screening</b> <ul style="list-style-type: none"> <li>• Pap Smear <i>Available at all SingHealth polyclinics. For enquiries, call the SingHealth Polyclinics Hotline**.</i></li> </ul>		<b>**SingHealth Polyclinics Hotline:</b> 6643 6969
<b>Colorectal Screening</b> <ul style="list-style-type: none"> <li>• Faecal Occult Blood <i>Available at all SingHealth polyclinics. For enquiries, call the SingHealth Polyclinics Hotline**. Requires a valid Lab Order Form from either a GP or polyclinic doctor.</i></li> </ul>		
<b>Cancer Genetics Service</b>	<b>National Cancer Centre Singapore</b> Crystal Suite Basement 2  <b>National Cancer Centre Singapore</b> Oncology Clinic Changi General Hospital Level 1	6436 8088

## Specialist Centres and Clinics

What	Where	Contact No.
<b>Specialist Clinics A and B</b> <ul style="list-style-type: none"> <li>Breast and Gynaecological Cancers</li> <li>Lymphoma and Sarcoma</li> <li>Neuro-oncology</li> <li>Palliative Medicine</li> </ul>	<b>National Cancer Centre Singapore</b> Level 1	6436 8088
<b>Specialist Clinic C</b> <ul style="list-style-type: none"> <li>Genitourinary Cancers (Bladder, Kidney, Prostate and Testicular)</li> <li>Head and Neck Cancers</li> <li>Lung Cancers</li> </ul>	<b>National Cancer Centre Singapore</b> Level 2	6436 8088
<b>Specialist Clinic D</b> <ul style="list-style-type: none"> <li>Gastrointestinal Cancers (Colorectal, Gastric, Liver and Pancreas)</li> </ul>	<b>National Cancer Centre Singapore</b> Level 2	6436 8088
<b>Specialist Clinic E</b>	<b>National Cancer Centre Singapore</b> Level 3	6436 8088
<b>NCCS Clinic F</b>  Clinics E and F (above) cover multidisciplinary cancer care for Breast, Head and Neck, Lymphoma, Gastrointestinal and Gynaecology.	<b>National Heart Centre Singapore</b> Level 2	
<b>NCCS Oncology Clinic at Changi General Hospital</b> Oncologic consultation and outpatient chemotherapy for CGH patients with Breast, Lung, Genitourinary, and Gastrointestinal Cancers	<b>Changi General Hospital</b> Main Building Level 1	6436 8008
<b>NCCS Oncology Clinic at Sengkang General Hospital</b> Consultation and outpatient chemotherapy for Breast, Lung and Gastrointestinal Cancer	<b>Sengkang General Hospital</b> Medical Centre Level 5	6436 8008

## Specialist Centres and Clinics

What	Where	Contact No.
<b>KK Gynaecological Cancer Centre</b> Screening and treatment for gynaecological cancers including Cervical, Ovarian, Uterine and Vulva Cancers, as well as risk evaluation and prevention and colposcopy	<b>KK Women's and Children's Hospital</b> KK Gynaecological Cancer Centre, Women's Tower Level 1	6394 8803
<b>KK Breast Centre</b> Screening, diagnosis and treatment of Breast Cancer and diseases	<b>KK Women's and Children's Hospital</b> KK Breast Centre, Children's Tower Level 1	6294 4050
<b>Children's Cancer Centre</b> A holistic and comprehensive range of services to treat children with cancer, including surgery, radiation therapy, chemotherapy, and haematopoietic stem cell transplantation and cancer immunotherapies	<b>KK Women's and Children's Hospital</b> Children's Cancer Centre, Children's Tower Level 7	6294 4050
<b>Specialist Clinic A</b> <ul style="list-style-type: none"> <li>• Lung Cancer Screening</li> </ul>	<b>Singapore General Hospital</b>	6222 3322 (Main Line)
<b>Centre for Digestive and Liver Diseases (CDLD)</b> <ul style="list-style-type: none"> <li>• Hepatopancreatic-Biliary clinic</li> <li>• Upper Gastrointestinal surgery</li> <li>• Colorectal Surgery</li> <li>• Liver Cancer Screening of Chronic Hepatitis patients</li> </ul>		6321 4377 (Appointment)
<b>Specialist Clinics J &amp; M</b> <ul style="list-style-type: none"> <li>• Breast Surgery</li> </ul>		

## Specialist Centres and Clinics

What	Where	Contact No.
<b>ENT Centre</b> <ul style="list-style-type: none"> <li>Nasopharyngeal Cancer</li> <li>Screening and other Head and Neck Cancers</li> </ul>	Singapore General Hospital	6222 3322 (Main Line)
<b>Haematology Centre &amp; Specialist Clinic K</b> <ul style="list-style-type: none"> <li>Lymphoma Screening of patients with enlarged lymph nodes or FBC abnormalities</li> </ul>		6321 4377 (Appointment)
<b>Obstetrics &amp; Gynaecology Centre</b> <ul style="list-style-type: none"> <li>Colposcopy Clinic</li> <li>Gynaecological Oncology</li> </ul>		
<b>Urology Centre</b> <ul style="list-style-type: none"> <li>Uro-Oncology Clinic</li> </ul>		
<b>SKH Medical Centre</b> <ul style="list-style-type: none"> <li>Upper Gastrointestinal &amp; Bariatric Surgery</li> <li>Thoracic Surgery</li> <li>Breast Centre</li> <li>NCCS Oncology at SKH</li> <li>Colorectal Surgery</li> <li>Hepatobiliary Surgery</li> <li>Urology</li> </ul>	<b>Sengkang General Hospital</b> Level 3  Level 4 Level 5 Level 5 Level 6 Level 6 Level 6	6930 6000 (Main Line)
<ul style="list-style-type: none"> <li>Oral Cancer Screening Clinic at Department of Oral and Maxillofacial Surgery</li> <li>Oral Care Clinic for Head and Neck Cancer patients</li> <li>Prosthetic, Speech and Swallowing Rehabilitation Clinic</li> </ul>	<b>National Dental Centre Singapore</b>	6324 8802

*Note: Besides the conditions listed, other types of cancers are attended to at the specialist clinics. For enquiries on cancers not specifically listed, please contact the respective institutions above.*

# YOUR DOCTOR VISIT

## What You Need to Bring Along

When seeking consultation at SingHealth institutions:

	For Singaporeans/ Singapore Residents	For Foreigners
<b>First Visit</b>	<ul style="list-style-type: none"><li>• NRIC</li><li>• Birth Certificate (if you are under 15)</li><li>• Civil Service Card/Public Service Card (for civil servants and their dependents only)</li><li>• Referral Letter (if any)</li><li>• Any other medical reports/biopsy results/x-ray films</li></ul>	<ul style="list-style-type: none"><li>• Passport</li><li>• Work Permit</li><li>• Employment Pass</li><li>• Referral Letter (if any)</li><li>• Any other medical reports/biopsy results/x-ray films</li></ul>
<b>Follow-up Visit</b>	<ul style="list-style-type: none"><li>• NRIC</li><li>• Appointment Card</li></ul>	<ul style="list-style-type: none"><li>• Passport</li><li>• Work Permit</li><li>• Employment Pass</li></ul>

### Making the most of your consultation with the doctor

When cancer is diagnosed, you enter a partnership in care with your doctor. As an informed patient who can participate actively in your treatment, you have the right to:

1. Ask your doctor questions
2. Be specifically informed about the important details of your care
3. Make an informed choice from the options available to you

Only your doctor can give you the information that is specific to you.

### Questions to ask your doctor

#### General

- What is the name of my cancer?
- What is the stage of my cancer?
- Which parts of my body are affected?
- Is it slow growing?
- Is it possible to completely cure my cancer?

#### About Tests

- Why are you doing this test?
- What will this investigation involve?
- What information will you get?

- How accurate is this test?
- What are the risks involved if the test is invasive?
- Will the results of this test make any difference to the treatment you provide?
- What are the results of the tests I have already had?
- How does the treatment work?
- What are the possible side effects of treatment?
- Can these side effects be prevented or controlled?
- Are the effects temporary or permanent?
- Will I receive treatment as an outpatient or be admitted to the hospital?

### About Your Treatment

- What treatments are available for my type of cancer?
- What is the aim of each treatment?
  - *Is it to cure?*
  - *Is it for temporary control?*
  - *Is it to reduce symptoms?*
- What is the chance of the treatment working?
- What will happen if I have no treatment?
- How long will it be before I know if the treatment is working?
- What difference will this treatment make to my quality of life?
- How is the treatment given?
- How much do these treatments cost?
- What can I do to help in the treatment?
- What if this treatment does not work?

### When you visit your doctor

- Prepare your questions beforehand.
- Write down the answers if possible.
- If you do not understand the answers, ask your doctor to explain them again.
- If you want to, bring a friend or relative for support.
- If you have difficulty communicating in English, ask for an interpreter.

# SUPPORTIVE CARE AND OTHER SERVICES AT SINGHEALTH

Supportive care in cancer is the prevention and management of the symptoms and side effects of cancer and its treatment, from diagnosis to the end of life.

---

## ■ *Supportive Care*

It includes support for patients, their families and their caregivers, focusing on improving quality of life for both survivors and those with advanced disease. It includes the treatment of pain and other symptoms, as well as addressing the psychological, social and spiritual needs of patients and their families.

Palliative care, a subset of supportive care, focuses on patients with stage 4 or advanced cancer.

Studies have shown that receiving supportive care has a positive influence on the course of illness, including better quality of life, better control of symptoms, and even an increase in survival rates.

Supportive care is delivered through a multidisciplinary team approach involving doctors, nurses, social workers/counsellors, pharmacists and other therapists. The team works closely with primary physicians and other community services to provide an extra layer of support. They also help

patients and families better understand treatment options and enable them to make decisions that are in line with their own values, goals and preferences.

## ■ *Dietetics and Nutritional Support*

Eating well is one way to fight cancer. Although there is no single food that can cure or prevent cancer, eating the right kinds of food before, during and after treatment can help a patient feel better and stay stronger.

A healthy diet can also help keep up strength, fight off infection, prevent body tissues from breaking down, and rebuild tissues that cancer treatment may harm.

Dietitians from each hospital will be able to give specific advice to suit each patient's needs. You can request for a referral to a dietitian from the doctor, should you require one.

## ■ *Psychosocial Services*

The Department of Psychosocial Oncology at National Cancer Centre Singapore (NCCS) attends to patients and their families who have difficulties

copied with their social, psychological and care from ill health and traumatic injuries.

The types of problems seen by our medical social workers are grouped into the following categories:

### ***Psychological***

- Family/couple/marital relationships
- Emotional/behavioural difficulties
- Anxiety over illness/treatment
- Loss/grief and bereavement issues

### ***Rehabilitation and Care of Patients***

- Discharge and continuing care of patients
- Homecare
- Special education/training/rehabilitation
- Work adjustments

### ***Financial Assistance***

- Assistance with payment of hospital treatment charges
- Subsidised treatment scheme assessment
- Short-term financial support to patients
- Assistance with purchases of equipment such as prosthesis/appliances and treatment aids

### ***Support Groups***

**You do not need to be a patient of a particular hospital or institution to join any of these support groups.**

When first diagnosed with cancer, most patients would experience fear, anger, anguish and helplessness. But it is important for them to realise that they are not alone.

Cancer support groups play a vital role in helping people cope with cancer and they work alongside conventional treatments such as chemotherapy and radiotherapy.

Support groups help individuals have a sense of control and personal responsibility in their own and their family's lives. This will allow patients to focus positively on their daily treatment and care, and ultimately enhance their quality of life.

SingHealth's hospitals and national centres conduct cancer support group activities throughout the year. Most of these support groups are facilitated and run by volunteers who are cancer survivors, patients, caregivers and healthcare professionals.

## 1. National Cancer Centre Singapore Support Programmes

To address the multifaceted needs of cancer patients at different touchpoints of their illness, NCCS' Division of Supportive and Palliative Care aims to develop a centre-wide integrated supportive care programme that stretches from diagnosis to survivorship or end of life.

The diagnosis and treatment of cancer often causes an increased risk of distress to patients, caregivers and family members. Besides the emotional turmoil, patients and their loved ones often face various practical, financial and psychosocial concerns throughout their illness trajectory. These issues are addressed by a team of medical social workers, clinical psychologists and counsellors through:

### **Financial Assistance Schemes**

If you require financial assistance, we recommend that you speak with your medical social workers as they will be able to provide recommendations on the various financial assistance schemes you are eligible for. Your doctor can help you to make a referral to see a medical social worker.

### **Counselling**

Patients and their loved ones respond to the diagnosis and treatment of cancer in a variety of ways. It is normal to feel worried, sad, angry, anxious, isolated and a loss of control over your life when affected by the illness.

### **Patient Support Activities**

In addition to individual and family counselling sessions, there is also a wide range of group-based activities to help individuals learn about coping and problem-solving from interacting with others in similar circumstances.

The activities include tumour type-specific support groups, psycho-educational groups, art therapy, and interest groups. Patient support activities are open to all individuals living with a cancer diagnosis and their loved ones in Singapore.

*If you are looking for support activities that may benefit you and your loved ones, please speak with NCCS staff at the Department of Psychosocial Oncology or contact [patientsupport@nccs.com.sg](mailto:patientsupport@nccs.com.sg) for more information.*

Similarly, if you or your loved ones would like to speak with NCCS medical social workers, clinical psychologists or counsellors on your worries and concerns, please let your doctor know. Your doctor can help you make a referral to the NCCS Department of Psychosocial Oncology.



Supportive and palliative care services support patients throughout their journey.

### 2. Singapore General Hospital's Support Groups

Support groups are an important source of emotional and psychological support for patients, family members, loved ones and caregivers. By encouraging active participation in discussion groups through meeting others with similar experiences, people find they are not alone in their battles. Some of the support groups facilitated by Singapore General Hospital (SGH) staff include:

#### ***The Bone Marrow Transplant (BMT) Support Group***

The group was first initiated by a few nurses assisting in the Post-BMT Clinic at the Haematology Centre. There was a high level of stress, fear, anxiety, anger and depression noted in post-BMT patients, especially during the first three months following therapy. The need to come back for repeated therapy also often disrupted the patients' personal lives and functional abilities.

*To obtain a membership form, please call 6321 4722.*

#### ***The Breast Cancer Support Group***

Formed in 1992, the Breast Cancer Support Group currently has about 30 former patients who volunteer to provide counselling and psychological support for breast cancer patients, their family members and caregivers. Members also work closely with the Reach to Recovery Mastectomy Support Group of the Singapore Cancer Society to plan and facilitate programmes.

*The Breast Cancer Support Group meets monthly. For enquiries, please call 6321 4474.*

#### ***Brain Tumour Society (Singapore)***

The support group by the Brain Tumour Society assists patients with brain tumours and their caregivers. For more information, please visit: [www.sgh.com.sg/patient-care/inpatient-day-surgery/Pages/Support-Groups.aspx](http://www.sgh.com.sg/patient-care/inpatient-day-surgery/Pages/Support-Groups.aspx)

### 3. KK Women's and Children's Hospital's Support Groups

#### ***KK Women's Cancer Support Group***

Started in 1991 by nurses and allied health professionals, the KK Women's Cancer Support Group provides emotional and psychological support to gynaecological cancer patients and their families, through counselling and befriending services. It also actively organises social activities and public forums to create a platform for patients and their families to interact among each other, to enhance their coping skills and create public awareness about gynaecological cancers.

The support group also consists of volunteers, some who had previously fought against cancer, who interact with patients to help them cope with their cancer diagnosis and treatment. They also befriend patients' families, encouraging and supporting them by sharing their own experiences with battling cancer.

### **KK Alpine Blossoms Breast Cancer Support Group**

The support group was launched in October 2008 as a breast cancer support group led by healthcare professionals, and has a structured programme to take patients through all phases of their journey – from diagnosis to treatment, remission and recovery from breast cancer.

All patients with breast cancer are encouraged to be part of the support group. It is open to breast cancer patients from any hospital, and family members and friends are also encouraged to join the support group activities.



The 'Blossom Buddies' programme offers support for newly diagnosed breast cancer patients.

The KK Alpine Blossoms Breast Cancer Support Group has a regular calendar of therapeutic activities, and holds meetings and discussions once every two months to empower patients to cope with the challenges of their journey and emerge as triumphant survivors.

The group also introduced the 'Blossom Buddies' programme, under which trained volunteers are carefully matched to patients such that their background profiles are similar, in order to render each other one-to-one support.

*For enquiries on membership, please call: Doris at 6394 5816 or Breast Care Nurse at 8121 7943.*

### **heART**

heART is an art-making support group open to all cancer patients seen at KKH. It was started in October 2009 as a support service under the Department of Psychological Medicine, facilitated by a psychiatrist with a passion for the arts.

The art sessions are held twice a month in the hospital, and all art materials are provided at no cost to the patients.

Patients do not need to have any arts background to join the group, and the sessions give them an opportunity to

seek mutual support, and allow them to de-stress.

Many participants have discovered their hidden talents and passion for the arts after joining the group. Besides art sessions, heART holds regular exhibitions to showcase the members' creations, and some of these works have also been printed as calendars.

### **Share-A-Craft**

The Share-A-Craft programme was started in January 2013. The concept behind this project is for patients to come together in a group and share the making of handicrafts with each other. After these patients have mastered the craft, they will share it with other patients and perhaps even with caregivers and hospital staff.

Visit [www.kkh.com.sg/heART](http://www.kkh.com.sg/heART) for more information.

Tel: 6394 2205



heART: Participants do not need an arts background to join.

## More support groups and programmes by SingHealth

### NATIONAL CANCER CENTRE SINGAPORE (NCCS)

For the following groups, please contact: Tel: 6436 8668

Email: [patientsupport@nccs.com.sg](mailto:patientsupport@nccs.com.sg)

1	<b>Adolescents and Young Adults / Sarcoma Support Group</b> A support group for adolescent and young adult cancer patients between 18 – 39 years and patients with sarcoma (regardless of age) and caregivers.
2	<b>Art and Wellness (A&amp;W) Support Group</b> A support group for cancer patients to come together to enjoy the process of art-making.
3	<b>The Revival Connection (TRC)</b> A support group for patients with advanced and recurrent cancer and their caregivers.
4	<b>Nasopharyngeal Cancer (NPC) Support Group</b> A support group for nasopharyngeal cancer patients of all stages and their caregivers. Other types of head and neck cancer patients are welcome to join.
5	<b>Sinar Harapan Support Group (Malay)</b> Through discussion and sharing of experiences, the Sinar Harapan Support Group aims to provide knowledge, psychological and emotional support to Malay cancer patients and their families as well as caregivers.
6	<b>Breast Cancer Support Group</b> A support group for cancer patients diagnosed with stage 0 – 3 breast cancer and their caregivers.
7	<b>SGH-NCCS Colorectal Support Group</b> A support group for colorectal cancer patients of all stages and their caregivers.
8	<b>At-Risk of Cancers (ARC) Support Group</b> For patients diagnosed with hereditary cancer syndromes and their caregivers.
9	<b>Look Good Feel Better (LGFB) Workshop</b> A 3-hour workshop on cosmetic techniques and alternative hair fashion for women cancer patients.
10	<b>Living Well Programme</b> Specially crafted for cancer survivors and their caregivers, the programme aims to address specific interests and concerns surrounding cancer survivorship through workshops and talks.
11	<b>Patient Empowerment Programme (PEP)</b> This programme is specially designed to facilitate personal growth. It comprises empowerment workshops to help patients and caregivers develop better coping skills throughout their cancer trajectory.

12	<p><b>Arts Express</b> A 3-day art therapy group for young children (aged between 7 and 12 years) whose parents are diagnosed with cancer.</p>
13	<p><b>HeARTS (Healing Arts)</b> A 3-day art therapy group for bereaved young children (aged between 7 and 12 years).</p>
14	<p><b>I CAN Express</b> A 4-session art therapy group for cancer patients to express their cancer experiences through art-making.</p>
15	<p><b>Open Art Studio at SGH Ward 48 (Inpatient)</b> A space to explore and engage in art-making for inpatient cancer patients and their caregivers.</p>
16	<p><b>(w)Rite Your Life!</b> A series of workshops that uses writing as a process to give you the seed to grow towards wholeness, leading you to live life more fruitfully.</p>
17	<p><b>Recital of Joy (ROJ) Music Interest Group</b> Learn to appreciate music and play instruments in this Recital of Joy Music Interest Group. No experience is required.</p>
18	<p><b>EnReach Retreat</b> NCCS' signature residential retreat for patients, caregivers and survivors to bond and learn how to cope with the illness through self-awareness, appreciation and resilience in coping.</p>
19	<p><b>CanSurvive Celebration</b> The National Cancer Survivor Day is an annual worldwide celebration of life. NCCS joins the global community in the month of June to celebrate those who survived, inspire those who are recently diagnosed and are undergoing treatment, and support the loved ones.</p>
20	<p><b>Grief in Recovery (GIR) Support</b> Grief in Recovery (GIR) Support Group is designed for bereaved spouses to come together for mutual support and encouragement in their journey through grief.</p>
21	<p><b>Bereaved Kith and Kin Group</b> A support group for individuals who have lost a family member or friend through cancer.</p>
22	<p><b>Caregivers Support Group</b> A platform for caregivers who are facing similar situations to share experiences and tips that are useful in providing care to patients with a cancer condition.</p>
23	<p><b>Mandarin Support Group</b> A support group that aims to provide knowledge, and emotional and psychological support to Mandarin-speaking patients and their caregivers.</p>

## KK WOMEN'S AND CHILDREN'S HOSPITAL (KKH)

24	<b>Family Resource Centre (FRC)</b> The FRC by Children's Cancer Foundation (CCF) at KKH provides counselling, therapeutic play and caregiver support services. The FRC is also stocked with reference books on childhood cancer and its treatment, toys, games, storybooks and arts and crafts materials that offer fun activities to help the children cope with the stress of being in the hospital. The FRC caters to both children with cancer and their families.  Contact: 6394 8237  Opening hours: Monday to Friday – 10am to 12.30pm   2pm to 5pm, Saturday – 10.30am to 12.30pm
25	<b>Caregivers Support Service</b> The Caregivers Support Service aims to enhance the coping of caregivers by addressing their practical needs, offering medical and psychosocial information, encouraging mutual support among caregivers and providing opportunities for self-care. Some of the services include weekly Caregivers' Massage Sessions, monthly inpatient support group session Time for a Caring Chat (TCC), Caregivers' Resource Pack, Caregivers' Lounge and beverages.  Contact: 6297 0203
26	<b>Love Continues (Bereavement Support Group)</b> Love Continues aims to promote acceptance and learning together in living with loss and grief. It also provides bereaved caregivers with a support network through sharing of experiences, and allows the group to forge an on-going friendship in their transition. The programme utilises therapeutic tools to help bereaved caregivers integrate the reality of the loss into the ongoing story of their lives, while also reconstructing their continuing bond with their loved ones.  Contact: 6297 0203

## CHANGI GENERAL HOSPITAL (CGH)

27	<b>Look Good Feel Better Workshop</b> Organised by Singapore Cancer Society and CGH Breast Centre, this programme supports women undergoing chemotherapy and radiotherapy by building self-esteem through a practical approach to the appearance-related side effects of cancer.  Contact: 6936 5307 / 6936 6304 (during office hours)
28	<b>Breast Care Support Group</b> A monthly support group with medical social workers and breast care nurses, only for newly diagnosed CGH patients who have undergone treatment. This support group is conducted in English and held on every last Saturday of the month.  Contact: 6936 5307 / 6936 6304 (during office hours)
29	<b>The Gutsy Warriors</b> An ostomy support group facilitated by colorectal nurses for patients who need a stoma following surgery. The members meet monthly to encourage one another.  Contact: 9665 9108 (during office hours)

# CLINICAL TRIALS

Clinical trials are also called research studies or tests of new treatments for people with diseases such as cancer. The goal is to find better ways to treat cancer and help cancer patients. Clinical trials test many treatments such as new drugs, new approaches to surgery or radiation therapy, new combinations of treatments or new methods such as gene therapy.

A clinical trial is one of the final stages of a long and careful cancer research process. The search for new treatments begins in the laboratory where scientists first develop and test new ideas. If an approach seems promising, the next step may be testing a treatment in animals to see how it affects cancer in a living being and whether it has harmful effects.

Of course, treatments that work well in the laboratory or in animals may not always work well in people.

Studies are carried out with cancer patients to find out whether promising treatments are safe and effective. While clinical trials have risks for the people who take part, each study also takes steps to protect patients.

When you take part in a clinical trial, you receive your treatment in a cancer centre, hospital, clinic and/or doctor's office. Doctors, nurses, social workers and other health professionals may be part of your treatment team.

---

**Clinical trials** seek **better ways** to treat cancer and help cancer patients.

---

# INTERNET RESOURCES

*Recommended websites for more information on cancer are listed below.*

## **National Cancer Centre Singapore**

As a national and regional specialty centre, the National Cancer Centre Singapore (NCCS) offers a one-stop, holistic range of clinical services to patients. It also conducts clinical and basic research, and develops public cancer education programmes wholly directed at the prevention and treatment of cancer.

[www.nccs.com.sg](http://www.nccs.com.sg)

## **Other SingHealth websites:**

- SingHealth  
[www.singhealth.com.sg](http://www.singhealth.com.sg)
- Singapore General Hospital  
[www.sgh.com.sg](http://www.sgh.com.sg)
- Changi General Hospital  
[www.cgh.com.sg](http://www.cgh.com.sg)
- Sengkang General Hospital  
[www.skh.com.sg](http://www.skh.com.sg)
- KK Women's and Children's Hospital  
[www.kkh.com.sg](http://www.kkh.com.sg)
- National Neuroscience Institute  
[www.nni.com.sg](http://www.nni.com.sg)

## **Singapore Cancer Society**

The Singapore Cancer Society is a self-funding voluntary welfare organisation with a mission to prevent and control cancer. It also seeks to enhance health and quality of life in the community through education, research and patient care services.

[www.singaporecancersociety.org.sg](http://www.singaporecancersociety.org.sg)

## **American Cancer Society**

The American Cancer Society (ACS) is a community-based voluntary health organisation dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer through research, education, advocacy and service.

[www.cancer.org](http://www.cancer.org)

### **MedlinePlus: Cancer Topics**

The National Library of Medicine (NLM) at the National Institutes of Health, USA is the world's largest medical library and the creator of MEDLINE. It contains over 12 million references to journal articles. MedlinePlus offers high-quality, current and totally private consumer health information.  
[www.medlineplus.gov/cancer.html](http://www.medlineplus.gov/cancer.html)

### **Macmillan Cancer Support**

Macmillan Cancer Support improves the lives of cancer patients and their families by providing up-to-date information, practical advice and support which can reduce the fear and uncertainty of cancer.  
[www.macmillan.org.uk](http://www.macmillan.org.uk)

### **World Cancer Research Fund**

World Cancer Research Fund (WCRF-UK) is dedicated to saving lives by funding cancer research and providing education that expands our understanding on the importance of food and lifestyle choices in the cancer process.  
[www.wcrf.org](http://www.wcrf.org)

### **National Foundation for Digestive Diseases**

The National Foundation for Digestive Diseases seeks to inform the public on the functions, as well as diagnosis, prevention and treatment of diseases of the digestive system.  
[www.nfdd.sg](http://www.nfdd.sg)

# GLOSSARY

## **Alpha-fetoprotein (AFP)**

AFP is an antigen normally produced in the foetus during its development. It can also be produced in the foetal liver in certain diseases of adults, such as liver cancer. High levels of AFP in an adult usually indicate testicular cancer or liver cancer.

## **Angiography**

An x-ray of blood vessels injected with dye. An angiography is a diagnostic test in which a radiopaque dye is injected into the bloodstream and x-rays are then taken. The dye makes the blood vessels show up on the x-rays, and any abnormal vessels can be seen. The x-ray is called an angiogram, or sometimes an arteriogram.

## **Benign**

Not cancerous. Benign tumours generally do not spread to tissues around them or to other parts of the body.

## **Colitis**

Inflammation of the colon.

## **Cryosurgery**

A procedure using freezing temperatures to destroy abnormal tissues.

## **Cystoscopy**

An examination of the bladder and urethra using a thin, lighted instrument (called a cystoscope) inserted into the urethra. Tissue samples can be removed and examined under a microscope.

## **Faecal Occult Blood**

A test to check for blood in stool (faecal refers to stool; occult means hidden).

## **Fine Needle Aspiration (FNA)**

The removal of tissue or fluid with a syringe and needle. This procedure is sometimes called a needle biopsy. Samples are examined under a microscope.

## **Gastrectomy**

An operation to remove all or part of the stomach.

## **Genetic Risk**

Women who are proven BRCA mutation carriers, untested first-degree relatives of known BRCA mutation carriers and those with strong family history and estimated to have at least 20-25 percent lifetime breast cancer risk by risk assessment models are considered to have genetic risk for developing breast cancer. These women have 5-10 percent increased risk of breast cancer compared to women without these risk factors. They frequently present before the age of 40 years.

## **Hysterectomy**

A surgery to remove the uterus and sometimes, the cervix. When the uterus and part or all of the cervix is removed, it is called a total hysterectomy. When only the uterus is removed, it is called a partial hysterectomy.

**Laparoscopy**

The insertion of a thin, lighted tube (called a laparoscope) through the abdominal wall to inspect the inside of the abdomen and to remove tissue samples.

**Laser Vaporisation**

A laser beam is used to destroy the abnormal cells on the cervix as well as some skin cancers. The treatment is very effective and the healing is excellent.

**Loop Electro-Excision Procedure (LEEP)**

This is a procedure to remove a pre-cancer on the cervix in the prevention of cancer development. It is performed on an outpatient basis under local anaesthetic. This procedure has emerged as one of the most cost-effective ways of treating cervical pre-cancers in the prevention of cervical cancer.

**Lumpectomy**

A surgery to remove the tumour and a small amount of normal tissue around it, particularly in relation to breast cancer.

**Lymph Nodes**

Small bean-shaped structures scattered along the lymphatic vessels, particularly in the neck, armpit and groin. They filter the lymph to remove bacteria and other harmful agents to prevent them from entering the bloodstream.

**Malignant**

Means cancerous. Malignant tumours can invade and destroy nearby tissues and spread to other parts of the body.

**Mastectomy**

The surgical removal of the breast.

**Pap Smear**

A Pap smear is a microscopic examination of cells scraped from the cervix. It is done to detect cancerous or precancerous conditions of the cervix.

**Polyps**

A growth that protrudes from a mucous membrane.

**Sigmoidoscopy**

Inspection of the lower colon using a thin, lighted tube called a sigmoidoscope. Samples of tissue or cells may be collected for examination under a microscope. Also called proctosigmoidoscopy.

**Wedge Resection**

A surgical procedure to remove a triangle-shaped slice of tissue. It may be used to remove tumours and a small amount of normal tissue around it.

# ACKNOWLEDGEMENTS

## National Cancer Centre Singapore

### **Associate Professor Toh Han Chong**

*Senior Consultant & Deputy Director (Education)*  
Division of Medical Oncology

### **Associate Professor Ravindran Kanesvaran**

*Senior Consultant and Deputy Head*  
Division of Medical Oncology;  
SingHealth Duke-NUS Lung Centre

### **Assistant Professor Tham Chee Kian**

*Senior Consultant and Deputy Head*  
Division of Medical Oncology

### **Adjunct Assistant Professor Chay Wen Yee**

*Senior Consultant*  
Division of Medical Oncology

### **Associate Professor Koo Wen Hsin**

*Senior Consultant*  
Division of Medical Oncology  
*Chairman*  
Division of Medicine  
Sengkang General Hospital

### **Associate Professor Darren Lim**

*Senior Consultant*  
Division of Medical Oncology  
*Director (Research) and Senior Consultant*  
SingHealth Duke-NUS Lung Centre

### **Dr Ng Quan Sing**

*Senior Consultant*  
Division of Medical Oncology;  
SingHealth Duke-NUS Lung Centre

### **Adjunct Associate Professor Daniel Tan**

*Senior Consultant*  
Division of Medical Oncology;  
SingHealth Duke-NUS Lung Centre

### **Assistant Professor Tiffany Tang**

*Senior Consultant*  
Division of Medical Oncology;  
SingHealth Duke-NUS Blood Cancer Centre

### **Assistant Professor Dawn Chong**

*Consultant*  
Division of Medical Oncology

### **Adjunct Assistant Professor Kiley Loh**

*Consultant*  
Division of Medical Oncology

### **Adjunct Associate Professor James B K Khoo**

*Senior Consultant*  
Division of Oncologic Imaging

### **Adjunct Assistant Professor Soong Yoke Lim**

*Senior Consultant*  
Division of Radiation Oncology

### **Adjunct Assistant Professor Alethea Yee**

*Senior Consultant*  
Division of Supportive and Palliative Care

### **Adjunct Associate Professor Veronique Tan**

*Head and Senior Consultant*  
Department of Breast Surgery  
(Division of Surgery & Surgical Oncology,  
SGH and NCCS);  
SingHealth Duke-NUS Breast Centre

### **Professor Iyer Narayanan Gopalakrishna**

*Head of Division of Medical Sciences*  
*Head and Senior Consultant*  
Department of Head & Neck  
(Division of Surgery & Surgical Oncology,  
SGH and NCCS);  
SingHealth Duke-NUS Head and Neck Centre

### **Professor Pierce Chow**

*Senior Consultant*  
Division of Surgery & Surgical Oncology,  
SGH and NCCS

### **Dr Ho Gay Hui**

*Visiting Consultant*  
Division of Surgery & Surgical Oncology,  
SGH and NCCS

### **Dr Gilbert Fan**

Master Medical Social Worker  
Department of Psychosocial Oncology

## Singapore General Hospital

### **Adjunct Associate Professor Wong Chow Yin**

*Senior Consultant*  
Department of Breast Surgery;  
SingHealth Duke-NUS Breast Centre

### **Associate Professor Tang Choong Leong**

*Senior Consultant*  
Department of Colorectal Surgery

### **Associate Professor Chow Wan Cheng**

*Senior Consultant*  
Department of Gastroenterology and  
Hepatology

### **Adjunct Associate Professor Aloysius Ho**

*Senior Consultant*  
Department of Haematology  
*Head and Senior Consultant*  
SingHealth Duke-NUS Blood Cancer Centre  
*Senior Consultant*  
SingHealth Duke-NUS Transplant Centre

### **Professor Tan Puay Hoon**

*Chairman and Senior Consultant*  
Division of Pathology

### **Assistant Professor Anantham Devanand**

*Senior Consultant*  
Department of Respiratory and Critical Care  
Medicine  
*Head and Senior Consultant*  
SingHealth Duke-NUS Lung Centre

### **Professor Wong Wai Keong**

*Chairman*  
Division of Surgery  
*Senior Consultant*  
Department of Upper Gastrointestinal and  
Bariatric Surgery

### **Ms Nagalingam Saraswathi**

*Senior Nurse Clinician*  
Specialty Care  
Department of Specialty Nursing

## Sengkang General Hospital

### **Professor Christopher Cheng Wai Sam**

*Chief Executive Officer*  
Sengkang General Hospital  
*Senior Consultant*  
Urology Service

## KK Women's and Children's Hospital

### **Dr Wong Wai Loong**

*Head and Senior Consultant*  
Department of Gynaecological Oncology

### **Dr Lim Swee Ho**

*Head and Senior Consultant*  
KK Breast Department  
*Senior Consultant & Service Chief (KKH)*  
SingHealth Duke-NUS Breast Centre

### **Associate Professor Tan Ah Moy**

*Senior Consultant*  
Haematology/Oncology Service;  
SingHealth Duke-NUS Blood Cancer Centre

### **Adjunct Associate Professor Joyce Lam**

*Deputy Head*  
Department of Pathology and Laboratory  
Medicine;  
*Senior Consultant*  
Haematology/Oncology Service;  
SingHealth Duke-NUS Blood Cancer Centre

### **Adjunct Assistant Professor Choo Chih Huei**

*Head and Senior Consultant*  
Women's Mental Wellness Service

## National Neuroscience Institute

### **Associate Professor David Low**

*Head and Senior Consultant*  
Department of Neurosurgery

## SingHealth Polyclinics

### **Adjunct Assistant Professor Adrian Ee**

*Chief Executive Officer and Senior Consultant*  
SingHealth Polyclinics

### **Dr Sally Ho**

*Senior Consultant*  
SingHealth Polyclinics – Outram



[www.singhealth.com.sg](http://www.singhealth.com.sg)

For enquiries, consult your GP/Family Doctor or contact us at:

**SingHealth Hospitals**



Singapore  
General Hospital

Tel: (65) 6321 4377  
[www.sgh.com.sg](http://www.sgh.com.sg)



Changi  
General Hospital

Tel: (65) 6850 3333  
[www.cgh.com.sg](http://www.cgh.com.sg)



Sengkang  
General Hospital

Tel: (65) 6472 2000 (until 31 May 2018)  
Tel: (65) 6930 6000 (from 1 June 2018)  
[www.skh.com.sg](http://www.skh.com.sg)



KK Women's and  
Children's Hospital

Tel: (65) 6294 4050  
[www.kkh.com.sg](http://www.kkh.com.sg)

**National Specialty Centres**



National Cancer  
Centre Singapore

Tel: (65) 6436 8088  
[www.nccs.com.sg](http://www.nccs.com.sg)



National Heart  
Centre Singapore

Tel: (65) 6704 2000  
[www.nhcs.com.sg](http://www.nhcs.com.sg)



Singapore National  
Eye Centre

Tel: (65) 6227 7266  
[www.snec.com.sg](http://www.snec.com.sg)



National Dental  
Centre Singapore

Tel: (65) 6324 8802  
[www.ndcs.com.sg](http://www.ndcs.com.sg)



National  
Neuroscience Institute

Tel: (65) 6330 6363  
[www.nni.com.sg](http://www.nni.com.sg)

**SingHealth Community  
and Primary Care**



SingHealth  
Community Hospitals

[www.singhealthch.com.sg](http://www.singhealthch.com.sg)



Polyclinics  
SingHealth

Tel: (65) 6643 6969  
[www.polyclinic.singhealth.com.sg](http://www.polyclinic.singhealth.com.sg)



**Health Buddy**

Download free app now!



- View or change your medical appointments
- Read up on medical conditions and treatments
- Access directory of SingHealth Specialists
- Health tips, Doctor Q&A, events, promotions