National University Cancer Institute Singapore

CHEMOTHERAPY

A GUIDE FOR PATIENTS AND THEIR FAMILIES

CONTENTS

CHEMOTHERAPY A GUIDE FOR PATIENTS AND THEIR FAMILIES

Cancer	**1**
Chemotherapy	**3**
Fever and Infection	**10**
Nausea and Vomiting	**11**
Diarrhoea	**12**
Constipation	**13**
Mouth Sores	**14**
Loss of Appetite / Alteration in Taste	**15**
Hair Loss	**16**
Fatigue	**18**
Effects on Skin and Nails	**19**
Effects on Kidney and Bladder	**20**
Effects on the Reproductive Systems	**21**
Bleeding	**23**
Peripheral Neuropathy	**24**

CANCER

WHAT IS IT?

The human body is composed of millions of tiny building blocks called cells. Normal healthy cells grow and divide in an orderly manner, so that growth and repair of body tissue can take place.

However, cell division may go wrong at times to produce abnormal cells which grow and multiply uncontrollably to form a tumour that possesses the ability to invade and spread to other parts of the body. Such cells are termed cancer cells.

WHAT IS THE CAUSE?

The exact cause of cancer is unknown. Most cancers occur spontaneously. However, the possible factors contributing to an increased risk of cancer include:

- Hereditary or genetic factors
- Viral infections e.g. Hepatitis B and C
- Environmental factors
- Diet

HOW MANY TYPES ARE THERE?

There are about 200 different types of cancers.

IS IT INFECTIOUS?

Although certain viral infections may lead to cancer, cancer in itself is not infectious and cannot spread from person to person.

IS IT PAINFUL?

Two-thirds of all types of cancers, even in their advanced stages do not cause pain.

WHAT ARE THE AVAILABLE TREATMENTS FOR CANCER?

Depending on the type of cancer, its extent, stage and overall health of the patient, the doctor may use any one or a combination of the following treatments:

- **Surgery** – using surgical procedures to remove the tumour from the body
- **Radiation Therapy** – using radiation to kill cancer cells
- **Chemotherapy** – using drugs to kill cancer cells, slow their growth or prevent them from spreading
- **Hormone Therapy** – using hormones to slow the growth of cancer
- **Biological Therapy** – using biological products to boost the body's natural defences or directly harm cancer cells and to target specific receptors to directly harm cancer cells
- **Stem Cell Transplantation** – infusion of healthy stem cells either from a donor or from the patient to allow higher doses of chemotherapy to be given and / or use the immune system to fight cancer (only applies to allogeneic transplantation)

CHEMOTHERAPY

WHAT IS IT?

Chemotherapy is the use of drugs to treat cancer.

HOW DOES IT WORK?

There are many different types of chemotherapy drugs that can work differently to kill cancer cells. Some may interfere with the growth and division of these cells. Others can help cause cancer cells to self-destruct. Chemotherapy can also prevent necessary blood and nutrients from reaching a tumour. Your doctors will choose chemotherapy that works best against your particular type of cancer.

Depending on the type of cancer and its stage, chemotherapy can be used to:

1. cure the cancer
2. slow the growth of cancer cells
3. keep cancer cells from spreading to other parts of the body
4. kill cancer cells that may have spread to other parts of the body from the original tumour
5. relieve symptoms caused by the cancer

HOW WILL I RECEIVE CHEMOTHERAPY?

Depending on the type of cancer you have and the drugs you are receiving, one or more of the following ways can be used:

- injection into a vein with a syringe or as an infusion (drip)
- injection into the muscle
- injection under the skin
- injection into the spinal cord
- orally in tablet or capsule form
- by application onto the skin
- by placing a catheter into the bladder
- by placing a catheter into the chest

IS IT PAINFUL?

Receiving chemotherapy by injection, orally or on the skin is usually no more painful than taking any other medicine by these methods.

However, your vein may become hardened or sore after repeated intravenous injections. Be sure to report to the doctor or nurse any pain or discomfort that occurs during or after an injection or infusion.

HOW OFTEN WILL I RECEIVE CHEMOTHERAPY?

You may receive chemotherapy daily, weekly or monthly, depending on the regimen you are on. Chemotherapy is often given in cycles, which includes a period of rest in between each treatment cycle. This is to give your body time to regenerate new cells to replace the normal cells that were affected by the chemotherapy drugs.

HOW LONG IS EACH CHEMOTHERAPY SESSION?

Some drugs used in chemotherapy are given as an intravenous infusion that may last for hours. Therefore, depending on the type and the number of drugs used in your chemotherapy regimen, as well as the method used to give the drugs, each treatment session may last from just minutes to hours.

HOW LONG WILL THE ENTIRE CHEMOTHERAPY TREATMENT LAST?

The type of cancer you have, the goals of the treatment, the drugs used, and the response of the cancer cells as well as the side effects you may have will determine the duration of your chemotherapy treatment.

DO I NEED TO STAY IN THE HOSPITAL TO RECEIVE CHEMOTHERAPY?

Generally, chemotherapy is given in the outpatient clinic.

However, you may need to stay in the hospital if your doctor feels that it is necessary to closely monitor your body's response to chemotherapy.

Some chemotherapy regimens may take many hours as the drug needs to be infused continuously for two to five days or longer. This can be done as an inpatient or outpatient.

WHAT SHOULD I DO IF I MISS A CHEMOTHERAPY SESSION OR SKIP A DOSE OF MEDICATION?

It is very important to keep to the chemotherapy schedule prescribed for you by the doctor. This is because missing or delaying your chemotherapy may affect the effectiveness of the chemotherapy regimen.

Occasionally, your next cycle of chemotherapy has to be delayed due to either low blood counts or severe side effects. Your doctor may then consider adjusting the dosage and will discuss this with you.

Consult your doctor or pharmacist immediately if you miss a dose of medication. They can advise you on the most appropriate course of action. Do not take a double dose of the medication to make up for any missed doses without specific instructions from your doctor because this may cause more harm to your body.

CAN I TAKE OTHER MEDICINE WHILE I AM ON CHEMOTHERAPY?

Some medicine, including over-the-counter medicine, herbal and traditional medicine, may interfere with the effects of drugs used in chemotherapy or may have unsafe effects too. It is therefore important to let your doctor know exactly what other medicine you are taking before starting or while you are on chemotherapy.

CAN I TAKE VITAMINS AND MINERAL SUPPLEMENTS?

Take a well-balanced diet to obtain necessary vitamins and minerals. You may take vitamin supplements but do discuss with your doctor beforehand.

CAN I TAKE ALCOHOL?

Discuss with your doctor first before consuming any alcohol and if safe, do so only in moderation.

WILL I HAVE TO ADJUST MY DIET WHILE I AM ON CHEMOTHERAPY?

Generally, there is no need to adjust your diet while you are on chemotherapy. However, you may be required to adjust your diet in the event that you experience certain side effects.

One point to note: as chemotherapy will weaken your immune system, it is safest to avoid raw or undercooked food such as sushi, raw meat and runny eggs to prevent infection. Bacteria are often present in uncooked food, which are usually killed by the cooking process. If your doctor determines it is safe to eat uncooked vegetables and fruits, they should be carefully washed first.

It is also very important to have a well-balanced diet while you are undergoing chemotherapy. People who eat well can cope with side effects better and fight infections more effectively. Moreover, having sufficient nutrients, especially proteins, will ensure that your body rebuilds tissues faster.

ARE THERE ANY SIDE EFFECTS OF CHEMOTHERAPY?

Chemotherapy is often linked to many side effects. While it is true that chemotherapy drugs often cause a wide range of side effects, most of these side effects are temporary and can be minimised or prevented.

Do remember that different drugs cause different side effects, and every individual experiences different side effects to different extents.

To understand more about your chemotherapy, please contact your pharmacists.

WHAT CAUSES THESE SIDE EFFECTS?

As cancer cells grow and reproduce rapidly, chemotherapy acts by killing these rapidly growing cells. However, these drugs also affect normal healthy cells resulting in side effects.

The types of cells most likely to be affected by chemotherapy would be those that reproduce rapidly, such as bone marrow cells (cells that give rise to blood cells) and cells in the digestive tract, hair follicles and the reproductive system.

HOW LONG DO THESE SIDE EFFECTS LAST?

Most normal cells recover quickly when chemotherapy is over; thus most side effects gradually disappear after treatment ends. The time it takes to recover from these side effects varies from person to person. These side effects can be unpleasant, but they can largely be well controlled with medicines e.g. anti-nausea drugs.

Cost of Chemotherapy

The cost of chemotherapy varies depending on the drugs and treatment prescribed. If you have concerns regarding the costs of chemotherapy, medical social workers are available (by appointment only).

SAFE HANDLING OF ORAL CHEMOTHERAPY MEDICINE

You may be prescribed oral chemotherapy medicine for your medical condition. This medicine is important to treat your condition, but it may cause harm when exposed to unintended users. Thus, it is important to handle this medicine with care.

Accidental exposure may occur through:

- Inhalation of dust produced when crushing or breaking the tablets / capsules.
- Inhalation of droplets produced when there is spillage of liquid syrups.
- Ingestion after contact with contaminated hands or environment.

General Precautions

- Tablets / capsules should be swallowed whole (not chewed).
- Do not crush or break tablets / capsules. Check with your pharmacist or doctor if you are unable to swallow them.
- If it is necessary to cut the tablets (e.g. into halves or quarters) to obtain the correct dose, a tablet cutter should be used. Do not use the same tablet cutter for cutting other medicines.
- Wash hands before and after taking the medications.
- Caregivers should not handle the medication with bare hands. Gloves should be worn. If there is accidental contact, hands should be washed immediately with soap and water.
- Pregnant and lactating females should avoid handling the medications.
- Keep all medicines in a safe place out of reach from children.
- If the medication requires refrigeration, it should be properly separated from other foods (i.e. use a resealable plastic bag or container). Do not store other foods or medicines in the same container.
- Use designated oral syringes or spoons for taking the medications. You may wash and reuse these for further doses, but do not use them for other purposes.
- If the doctor decides to stop treatment, return the remaining medicine to the pharmacy for proper disposal.

FEVER AND INFECTION

Chemotherapy can reduce the number of white blood cells which your body produces. When this happens, you are more likely to get infections. Common illnesses such as fever, cough and cold may become severe. It is therefore important for you to prevent infections.

You must call:

National University Cancer Institute, Singapore:
6773 7888 (Mon-Fri, 8.30am – 5.30pm)

CancerLine:
9722 0569 (Mon-Fri, 8.30am – 5.30pm)

If:

- your temperature reaches 38°C at any time
- you are having symptoms of infections such as:
  chills, severe cough or sore throat, burning pain when passing urine, persistent diarrhoea or shortness of breath

At the Emergency Department, you must inform the doctor on duty that you are receiving chemotherapy.

Helpful Tips

- Practice good personal hygiene.
- Wash your hands well before eating and after going to the washroom.
- Avoid contact with people who have cough, cold and other infections.
- Avoid crowded places.
- Avoid taking raw food or food that is not well cooked.
- Check your temperature with a thermometer whenever you feel unwell or feverish.
- If you develop a fever, seek medical attention, do not self-medicate.

NAUSEA AND VOMITING

Every patient reacts differently to chemotherapy. Many people may feel nausea. There are also some who may experience vomiting. Nausea and vomiting can be controlled or lessened by medication. Your doctor may prescribe anti-vomiting medication to be taken after your chemotherapy, even if you do not experience much nausea. Do follow the instructions or discuss this with your doctor or nurse.

You must call your doctor or nurse if you:

- are not able to drink or eat enough
- continue to have nausea and vomiting for more than 24 hours despite taking the prescribed anti-vomiting medication

Helpful Tips

- Take your dexamethasone with meals.
- Avoid taking a heavy meal just before chemotherapy.
- Try eating small meals at frequent intervals eg. six small meals instead of three large meals per day.
- Eat and drink slowly. Chew your food well for easier digestion.
- Avoid oily and spicy foods.
- Avoid drinking too much fluid at meal time.
- Avoid excessive fizzy drinks, coffee or tea.
- Avoid foods with strong smells or flavours like durian.

DIARRHOEA

Chemotherapy may affect the cells lining the intestine to cause diarrhoea.

Certain chemotherapy drugs have a higher chance of causing diarrhoea. Your doctor will prescribe anti-diarrhoea medications with instructions. Make sure you read and understand these instructions.

Contact your doctor or nurse if you have:

- diarrhoea that persists for more than 24 hours, or diarrhoea with severe pain or cramps despite taking anti-diarrhoea medicine
- diarrhoea for more than six times with large amount of watery stool despite taking anti-diarrhoea medicine

Helpful Tips

- Drink lots of fluids.
- Avoid eating too much high fibre food such as whole grain bread, cereals, beans, raw vegetables and fruits.
- Avoid tea, coffee, fried, greasy or spicy food.
- Avoid milk or other dairy products. They may worsen your diarrhoea.

CONSTIPATION

Constipation could be an unpleasant side effect of chemotherapy. However, constipation may also occur for other reasons such as when an individual is less active or less nourished than usual.

Do notify your doctor if you:

- have not had any bowel movement for more than three days

Your doctor may prescribe some medicine to assist your bowel movement.

Helpful Tips

- Drink lots of fluids. Take at least eight glasses of water / other fluids a day.
- Eat a high fibre diet.
- Exercise regularly. Low impact exercises like walking may help to improve bowel movement.

MOUTH SORES

Some chemotherapy drugs cause sores in the mouth and throat. These sores may be painful and may become infected. It is therefore important for you to have good mouth care to keep your mouth and throat clean.

You must call your doctor or nurse if you have:

- Sores in your mouth
- White spots/patches in your mouth
- Pain in your mouth
- Difficulty eating, drinking or swallowing
- Unusual amount of bleeding

Helpful Tips

- Try to see your dentist for a check-up and cleaning before starting chemotherapy.
- Brush your teeth twice a day with a soft toothbrush.
- Rinse your mouth with water after every meal.
- Do not use mouthwashes that contain alcohol. It makes your mouth drier.
- Check your mouth once a day for white spots/patches or mouth sores. Call your nurse for advice if you do develop any of these.
- Your doctor may prescribe a mouthwash to relieve any discomfort.
- Avoid hot scalding soups and beverages.
- Avoid spicy foods if mouth sores are present.

For those with dentures

- Remove your dentures / partial plate before your mouth care.
- Try not to wear your dentures / partial plate unless it is necessary.
- Always clean and brush your dentures / partial plate before placing it in a regular soaking solution.

LOSS OF APPETITE / ALTERATION IN TASTE

Loss of appetite and alteration in taste are common side effects for patients undergoing chemotherapy. Loss of appetite may also be due to the cancer itself, or even emotional stress. However, it is important for you to maintain an adequate intake of protein and calories so that your normal cells can repair and regenerate effectively.

Helpful Tips

- Try eating small meals at frequent intervals eg, five to six small meals instead of three meals per day.
- Try to eat at least one third of your required protein and calories intake in the morning when your appetite is usually best.
- Take other food supplements such as Ensure, Isocal, Resource, Sustagen etc.
- Avoid foods that are filling or gas-forming such as beans, cabbage or broccoli.
- Take a short walk or do a brief exercise before meals.
- Use mouth wash frequently to remove any bitter or metallic taste.

HAIR LOSS

Chemotherapy can weaken the hair follicles and cause hair to fall out much more quickly than usual. However not all chemotherapy drugs cause hair loss. Your nurse or doctor will inform you if the drugs that you are receiving are likely to cause hair loss.

Hair loss does not happen immediately. Hair becomes thinner and starts to fall out gradually or in clumps, two to three weeks upon starting treatment or after a few treatments. This will depend on the type of treatment you receive. You may experience hair loss on all parts of the body and not just the head.

Your hair will usually start to grow back completely from six to twelve months after completion of treatment. Your hair may also start to grow while you are still receiving treatment. The texture and colour of your new hair may be different, for example, curly hair becomes straight and dark hair becomes lighter.

Hair loss can be disturbing; it affects one's self-image and quality of life. Contact your nurse and talk about your feelings if you are:

- angry and / or upset about your hair loss
- seeking practical tips to improve your physical appearance

(Your nurse will arrange for you to attend a 'LOOK GOOD FEEL BETTER' workshop where you can learn beauty techniques to manage appearance-related changes from cancer treatment.)

Helpful Tips

- Keep your hair short. This can make your hair look thicker and fuller and also make hair loss easier to manage.
- Use mild shampoo and be gentle when washing your hair.
- Use a soft hair brush or wide-toothed comb.
- Avoid using hair dryers, hair rollers, clips or bands.
- Do not colour or dye your hair.
- Buy a wig before all your hair falls out. This will not only prepare you for potential hair loss, but also allows you to get a wig that matches your natural hair colour.
- You may prefer to use a scarf, cap or turban as a bald head is more susceptible to sunburn. These accessories come in a variety of colours and fabrics that can also make you look good.

FATIGUE

Fatigue is a feeling of tiredness that can keep you from doing the things you normally do or want to do. It may be physical, emotional, and / or mental exhaustion. Your body, especially your arms and legs, may feel heavy. You may have less desire to do normal activities like eating or shopping. Sometimes you may find it hard to concentrate or think carefully. Fatigue is very common among people on chemotherapy treatment. The exact cause of fatigue is unknown but factors such as the cancer itself, low blood counts, nutritional problems and sleep problems contribute to fatigue.

You may want to talk to your nurse if:

- you have been too tired to get out of bed for the past 24 hours
- you feel confused or cannot think clearly
- your fatigue worsens

Helpful Tips

- Rest and sleep are important, but do not overdo it. Too much rest can decrease your energy level and may make you feel more lethargic. If you have trouble sleeping, talk to your doctor or nurse.
- Stay as active as you can. Regular exercise like walking several times each week may help.
- Drink plenty of fluids and eat nutritious foods.
- You can do more by spreading your activities throughout the day. Take breaks between activities. Let others help you with meals, housework or errands. Do not force yourself to do more than you can manage.
- Do activities that you enjoy and make you feel good. Try listening to music, visiting friends and family or looking at pleasant pictures. Try to do these activities at least three times per week.
- Talk to your nurse (or doctor too) if you experience severe anemia symptoms (e.g: pale skin).

EFFECTS ON SKIN AND NAILS

Skin can start to peel or become dry, red, itchy, darker and sensitive to sunlight after chemotherapy. Sometimes, the nails may become dark, yellow, brittle or loosen and fall off. New nails will usually grow back.

Helpful Tips

- Use moisturising lotions on skin and nails (hands and feet).
- Use moisturising shower and handwash lotions.
- Avoid exposure to sunlight and tanning booths. Apply sunscreen that is SPF 15 or higher whenever you leave the house.
- Wear gloves when doing household chores and working with tools or detergents.
- Wear shoes that are well fitted to protect the toes and feet.
- Inspect your hands and feet daily for changes.
- Contact your doctor or nurse if you experience severe rashes and / or blistering / painful rashes.

EFFECTS ON KIDNEY AND BLADDER

Some chemotherapy drugs may affect and damage the bladder and kidney. These side effects can be permanent or temporary. Therefore, it is important to recognise their signs and symptoms.

You must inform your doctor or nurse if you have:

- experienced pain or a burning sensation when passing urine
- urgency in urination
- reddish or bloody urine
- significant reduction in urine output

Helpful Tips

- Drink lots of fluids. Take at least eight glasses of water or other fluids per day. This is especially important for the first few days after chemotherapy.
- Limit your intake of drinks that contain caffeine (e.g: black tea, coffee and some cola products).

EFFECTS ON THE REPRODUCTIVE SYSTEMS

For men, chemotherapy drugs can cause:

- a decrease in sperm count
- infertility (may be temporary or permanent)

For women, chemotherapy drugs can cause:

- damage to the ovaries
- a decrease in the amount of hormones
- menstrual period to become irregular and may even stop completely
- menopausal like symptoms e.g. hot flushes, itching, burning or dryness of the vaginal tissue
- tissue changes which may result in painful sexual intercourse and vaginal infection
- infertility (may be temporary or permanent)

If you have any questions or concerns about these issues, please do not hesitate to discuss them with your doctor or nurse.

Helpful Tips

- For males: Opt for sperm banking prior to chemotherapy if you would like to father a child in future.
- Use a lubricating water-based jelly to reduce dryness of vagina and pain during sexual intercourse.
- You must avoid getting pregnant while you are on chemotherapy. Chemotherapy may have harmful effects on the developing baby.
- Avoid pregnancy for up to two years after the last dose of chemotherapy.

If you experience hot flushes, you should:

- avoid caffeine and alcohol
- do regular physical exercise
- inform your oncologist if the symptoms are affecting your daily routine

BLEEDING

Chemotherapy can reduce platelets which your body produces. Platelets help stop bleeding by making the blood clot. A low platelet count may cause you to bleed or bruise more easily than usual.

You must inform your doctor or nurse if you have:

- bleeding from your nose or gum
- blood stained urine / stools or black and tarry stools
- small red spots appearing on your skin
- unusual bruises
- blood-stained phlegm / sputum
- increased blood loss from menstruation

Helpful Tips

- Avoid contact sports or strenuous activities that may cause injury.
- Avoid forceful blowing of your nose.
- Use a soft toothbrush to brush your teeth.
- Ensure that dentures are well fitted.
- Do not take any medicine without first consulting your doctor, especially aspirin or other pain relief medicine.
- Inform your dentist / surgeon that you are on chemotherapy before any dental / surgical procedures.
- Avoid massage, acupressure and acupuncture that may cause bleeding.
- Avoid the use of razor blades, nail clippers or dental floss to reduce chances of injury and bleeding.

PERIPHERAL NEUROPATHY

This refers to numbness, burning or tingling sensations over the fingers and toes, which may persist for some time after completion of chemotherapy. This may occur after chemotherapy that affects the peripheral nerves in the limbs. Depending on the type of cancer and treatment prescribed, patients may experience mild to severe forms of peripheral neuropathy. For example, patients may experience mild discomfort or difficulties in performing tasks requiring fingers, e.g. buttoning.

Helpful Tips

- Practice foot care and wear proper shoes to prevent injuries.
- Minimise or prevent falls.
- Gentle massage for hands and feet may improve circulation, stimulate the nerves and provide temporary relief for pain.
- Report any change in sensation to the medical team to allow titration of drugs.

CONTACT INFORMATION

National University Cancer Institute, Singapore (NCIS)
1E Kent Ridge Road
NUHS Tower Block, Level 7
Singapore 119228
Email : ncis@nuhs.edu.sg
Website : www.ncis.com.sg

Cancer Centre @ NUH Medical Centre, Level 10
Chemotherapy Centre and Stem Cell Therapy Centre @ NUH Medical Centre, Level 9
Radiation Therapy Centre @ NUH Medical Centre, Level 8
Appointment Line : (65) 6773 7888 (Monday to Friday: 8.30am to 5.30pm)
Fax : (65) 6777 4413
Email : CancerApptLine@nuhs.edu.sg

Breast Care Centre @ NUH Medical Centre, Level 8
Appointment Line : (65) 6772 2002 (Monday to Friday: 8.30am to 5.30pm)
Fax : (65) 6734 2574

CancerLine
Staffed by trained oncology nurses, this is a FREE, anonymous and confidential information and counseling service for patients, their families and members of the public on cancer-related issues.

CancerLine : (65) 9722 0569
(Monday to Friday: 8.30am to 5.30pm)
Fax : (65) 6772 5829
Email : CancerLineNurse@nuhs.edu.sg

Connect With Us

www.facebook/com/NationalUniversityCancerInstituteSingapore

NCIS NUHS

**For cancer drug enquiries, you may reach the cancer centre pharmacists through the cancerline number listed above.*

LOCATION Nearest MRT station: Kent Ridge station (Circle line)

Commuters can alight at the Kent Ridge Station, right at the doorstep of the NUH Medical Centre. Please exit the station via Exit C. NCIS is located on levels 8, 9 and 10 which are accessible via Lift Lobby A.

For more information on specific directions to NCIS Clinics, log on to www.ncis.com.sg. For more information on directions to NUH, log on to www.nuh.com.sg.

Information in this handbook is given as a guide only and does not replace medical advice from your doctor. Please seek advice from your doctor if you have any questions related to the surgery, your health or medical condition.

Information is correct at time of printing (Jan 2020) and subject to revision without notice.