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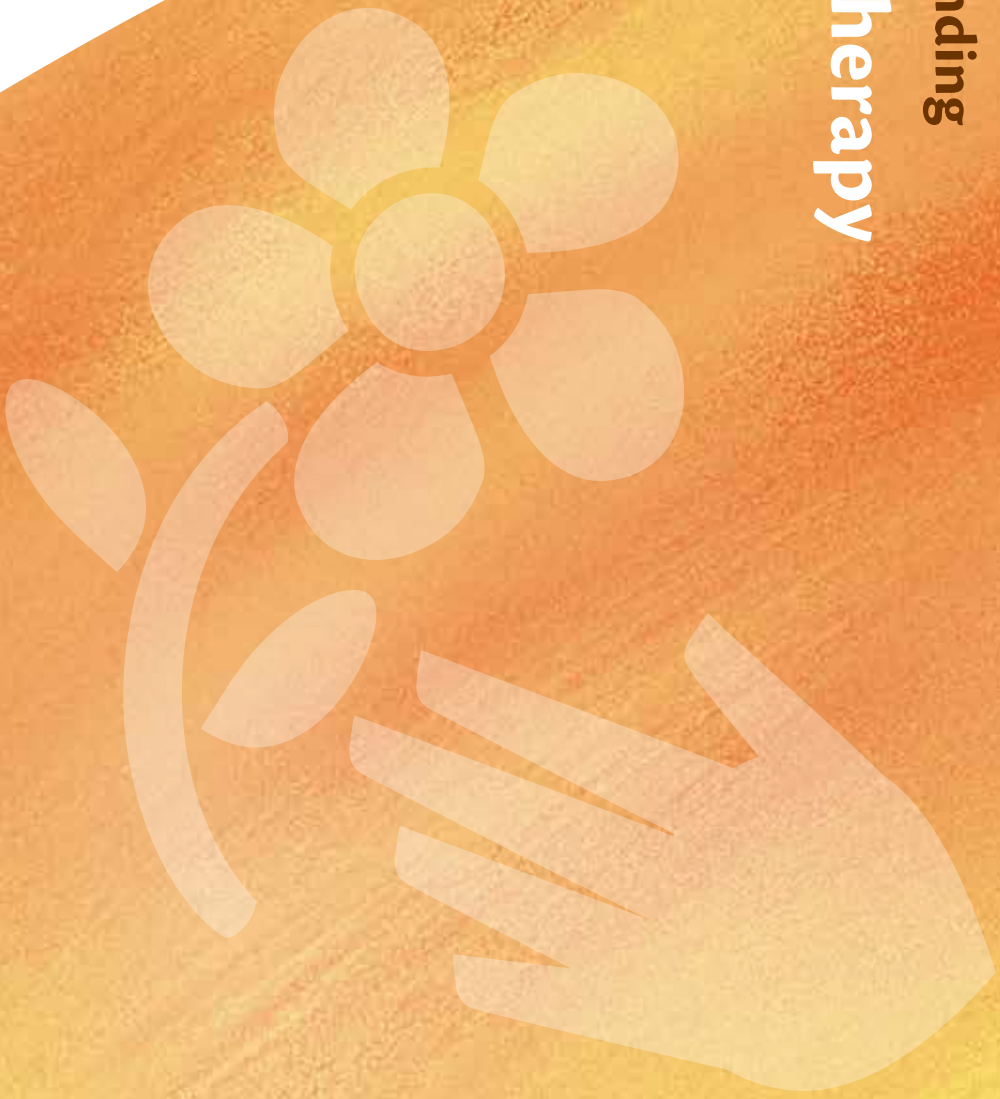
So no one faces cancer alone

understanding Radiotherapy



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CancerFund

Hong Kong Cancer Fund was established in 1987 to provide support, information and care to those living with cancer and to increase awareness and knowledge of cancer in the community.

Our CancerLink support centres offer professional support and connect 22 cancer peer groups to form an extensive service network for those with cancer and their families, providing emotional support and practical assistance.

This publication is one in a series of information booklets that discuss different aspects of cancer, including possible treatment, side effects and emotional issues. They are intended to inform you about available treatments and care. A soft copy of the booklet is also available on our website for free download.

The free services offered by Hong Kong Cancer Fund are made possible only through donations from the public. If you would like to show your support and concern for cancer clients, please contact us. Your generosity will directly benefit those touched by cancer in Hong Kong.

So no one faces cancer alone

FREE service hotline

3656 0800

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Introduction

We hope this booklet can answer some of the questions you may have about radiotherapy: one of three basic treatments for cancer alongside surgery and chemotherapy.

Cancer is a complicated illness. Successful treatment depends on both the tumour, and the general health of the patient. No two cases are exactly the same.

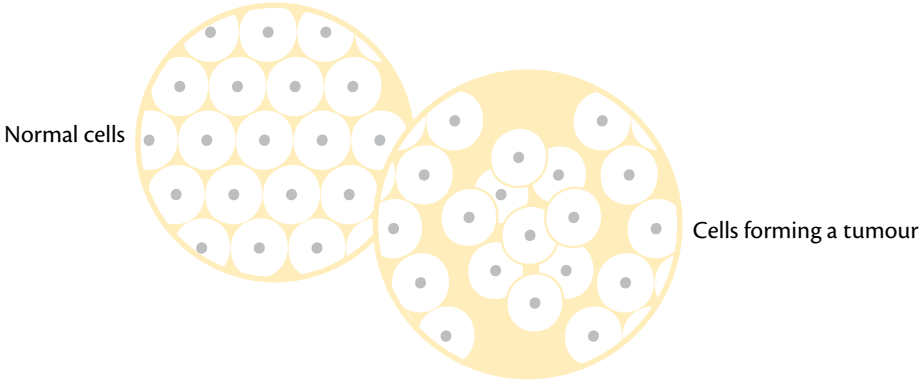
If you do receive radiotherapy, the way it's applied may be somewhat different from the approach used on fellow patients. Only your doctor can decide on your treatment. This booklet is no substitute for professional medical advice. If you have any doubts, raise them with your doctor.

If you find this booklet helpful, please pass it along to others who might be concerned. They may wish to have more information to help navigate through this difficult situation.

Contents

What is cancer?

Cancer is a disease of our cells, which are the body's building blocks. Our cells divide constantly to enable us to grow, to replace worn-out cells, and to heal damaged cells after an injury.



Cells normally divide in an orderly way, guided by their genes. But, occasionally, genes can be damaged due to our living environment or hereditary problems in the family, causing cells to divide and multiply uncontrollably, forming a lump called a tumour.

Not all tumours are cancerous. Benign (non-cancerous) tumours do not spread outside their normal boundary. While some benign tumours are pre-cancerous and must be treated before they turn malignant, most stop growing at a certain point and pose no discernible problem. You can, of course, have it removed by surgery or other means. But in general, unless it becomes too big and presses on tissues and organs or impedes the function of your body, it may be advisable to leave it and have regular check-ups to monitor it.

Malignant (cancerous) tumours are ones in which the cells multiply excessively and uncontrollably and form a lump. They can also migrate to other parts of the body (a secondary cancer site or metastasis) and start to drain our energy. If not treated in time, we can be consumed by them.

Cancer spreads via the body's fluid channels

There are two crisscrossing 'canal' systems in our body: blood vessels compose the blood and circulating systems, and lymph vessels compose the lymphatic system. If cancer cells enter nearby blood vessels or lymph vessels, they can reach other tissues and organs and settle there, forming secondary cancer sites. A cancer that has spread not only causes more harm to the body but is more difficult to treat than one sitting in just the original location.

Some Common Cancer Treatments

There are three common treatments for cancer.

Surgery is an effective way to remove tumours that are confined to a small area. Chemotherapy requires an injection, or sometimes an oral tablet. The chemotherapy drug circulates in the blood and kills cancer cells throughout the body. Radiotherapy uses high energy X-rays to destroy cancer cells in a localised area.

Your doctor will plan your treatment based on:

- the cancer cell grade (how fast the cancer cells will grow and divide)
- location (how close the cancer cells are to vital organs)
- stage (how big the tumour is) and
- how far cancer cells have spread from their original site
- your age, general health condition
- your willingness to be treated including treatment expectations and the side effects you're willing to accept.

Each treatment option has its own advantages and side effects. The extent of side effects may vary between individuals, too.

With the advancement of cancer treatment, your doctor will generally use surgery, radiotherapy and chemotherapy together (combination therapy) to achieve the best results. While sometimes used as the primary treatment, radiotherapy is more often used to supplement surgery (either after surgery to remove residual cancer cells, or to shrink the tumour before surgery to pave the way for operation).

	Surgery	**Radiotherapy**	**Chemotherapy**
Treatment media	Surgical knife	High-energy radiation	Chemical drugs
Treatment location	Operation theatre	External radiotherapy: treatment room Internal radiotherapy: operating theatre	Medical centre or hospital outpatient department

Radiotherapy

Radiotherapy uses high-energy radiation to destroy cancer cells. Normal cells near the tumour will be affected by the radiation, which causes side effects. Your clinical oncologist will plan your treatment to minimise harm to normal cells.

Radiotherapy can be given either using a high-energy beam emitted from a machine outside the body (external radiotherapy), or by inserting a radioactive source into your body cavity (internal radiotherapy) near the tumour area (e.g. stomach, bladder, uterus).

Making arrangements for radiotherapy

Radiotherapy may make you feel tired. You may have to take time off from your work or duties during treatment. Or, you may still be able to follow your daily routine. You can discuss this process with your employer, family or medical social worker before making special arrangements in advance of treatment.

Tell your employer that you're undergoing cancer treatment. Let your colleagues share your burden. Ask those close to you to take on your household chores. Talk with medical social workers to see whether any assistance can be arranged to help you during this period. Adjust your life according to how you feel as treatment goes on. There's nothing wrong if you find yourself unable to do things you used to do before the cancer diagnosis.

When radiotherapy is used to:

Cure cancer (also called 'radical treatment'). If the tumour is relatively small, radiotherapy may be able to eliminate it altogether. But, to reduce the risk of cancer coming back afterwards, radiotherapy is most often used in combination with surgery or chemotherapy.

Relieve the discomfort of cancer (also called 'palliative treatment'). If cancer

has spread, radiotherapy can help to relieve the discomfort caused by cancer, and to slow down further growth.

Remove benign tumours. Radiotherapy can be used to remove benign (non-cancerous) tumours, like those growing on blood vessels (angioma), on the skin (keloid) or in the brain.

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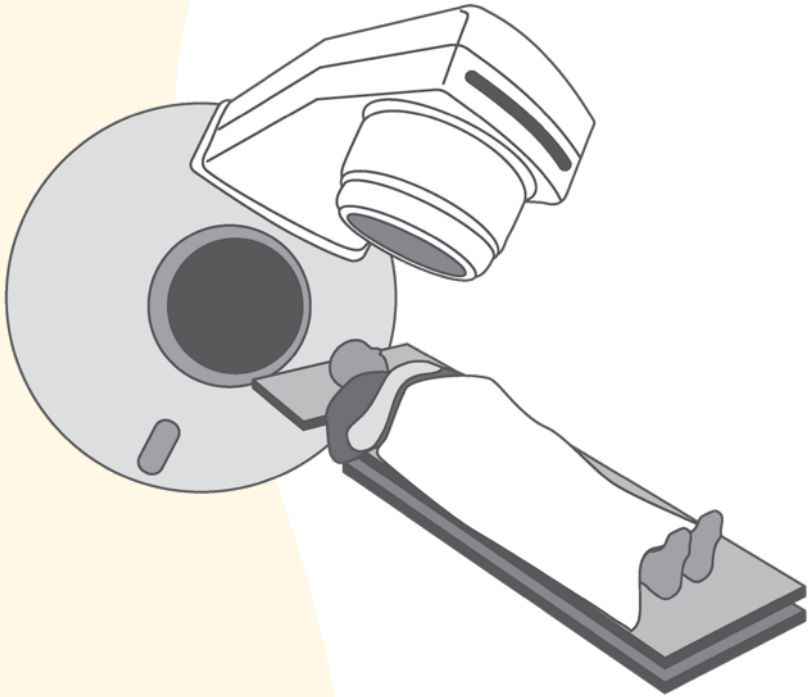
External Radiotherapy

External radiotherapy uses high-energy rays generated by a linear accelerator to destroy cancer cells. The radiation penetrates the body surface to reach the tumour.

Before treatment is delivered, your clinical oncologist has to tailor your treatment plan. Using diagnostic imaging, your oncologist can locate the tumour and identify its shape. This data will then be used to calculate the entry point and angle of the radiation beams, as well as the required radiation dosage.

Getting external radiotherapy is like having an X-ray. The radiotherapist will position you on the treatment couch for optimal results. Each treatment session will only last a few minutes. You'll carry no harmful radiation once the machine is turned off. Feel free to gather with your family and friends afterwards.



External radiotherapy treatment machine

Plan for external radiotherapy

A team of medical professionals (including an oncologist, radiologist and radiotherapist) will collaborate to carefully plan your treatment in order to get the best results, while doing as little harm as possible to normal tissue.

You may be required to travel back-and-forth to the hospital a few times for pre-treatment calibration and simulation to ensure everything is ready before the treatment starts.

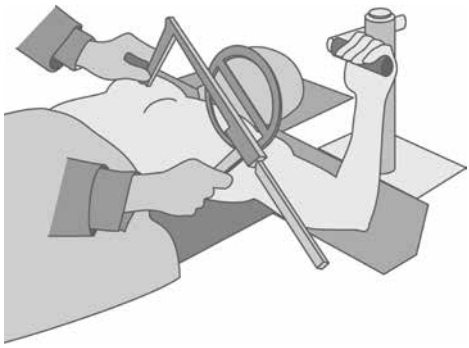
The duration of your treatment and the dosage of radiation used depend on:

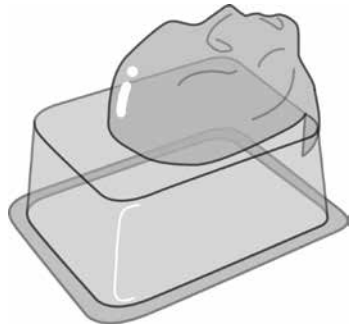
- The type of tumour
- The location of the tumour
- The size of the tumour
- The proximity to organs
- Your general health condition and medical history

Before treatment, you'll have to sign a letter of consent. Should you have any doubts about the treatment, raise them with your doctor. Make sure you feel comfortable before giving consent. Your doctor will be glad to explain, point out any possible side effects and tell you how to deal with them.

For pre-treatment preparation, you may be given an MRI (magnetic resonance imaging) scan, followed by a CT (computed tomography) scan to determine the three-dimensional location and shape of the tumour, as well as its distance from nearby organs. Imaging tests are like having an X-ray; all you have to do is lay still. You will feel nothing while pictures are taken. Before taking pictures, a liquid may be injected into your vein to enhance the image.

Images of the tumour region are used to define the area that will receive radiation in order to avoid nearby normal tissues as much as possible. The three-dimensional size and shape of the tumour will be fed into a computer to determine a radiation dosage (beam intensity) that will kill the highest number of cancer cells, while keeping side effects to a minimum.





After developing the treatment plan, you'll be informed about the first date of your treatment. A course of radiotherapy usually consists of several weeks of daily sessions (Mon-Fri). All daily sessions will be conducted at the same time each day to give you 24 hours between sessions, allowing normal cells to recover from damage and making it easier for you to adapt to treatment.

To prepare you for treatment, your radiotherapist will mark your skin to designate the entry point of the beam. Make sure that this mark is sharp and visible for the entire course of treatment. Ask your radiotherapist to redraw it in case it fades or gets blurred. Don't try to do this yourself.

To secure the body parts being treated (eg. the head or neck) the technician may custom-build a plastic module for you to wear during treatment.

When your head or neck receives radiation, you may also need other custom-made materials (e.g.. teeth wax to reduce side effects in your mouth).

Treatment procedure

During each daily treatment session, all you have to do is lay still on the platform in the right position, and maintain the same position in every session.

Once in the treatment room, your therapist will help you lay on the platform in the position as determined by the preparatory session. Once set, he or she will retreat to an adjacent room to monitor the treatment on CCTV, or through a window panel separating the two rooms. During the few minutes the beam is turned on, all you have to do is to lay still and breathe as usual. Aside from hearing some noise from the machine itself, you'll feel nothing. In the meantime, if you need anything, or you feel uncomfortable, raise your hand or use the intercom to notify your therapist.

External radiotherapy techniques

Radiotherapy machines are basically a linear accelerator (LINAC) linked to a computer. The accelerator emits a high-energy beam, while the computer helps to aim the beam at the tumour and set the right intensity. With the advancement of technology, the beam gets more precise and can deal with some tumours that were previously untreatable.

Here are a few types of radiotherapy machine used in Hong Kong:

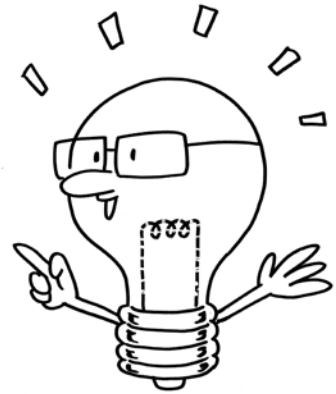
2D conventional radiotherapy

Used for: all solid tumours

2D (2-dimensional) technology focuses only on the cross-section (flat surface) of the tumour. Since the depth of the tumour has not been taken into account, a wider treatment area will be chosen to make sure all cancer cells are rounded up. This larger treatment area also affects more normal cells.

3D conformal radiotherapy

Used for: all solid tumours



3D conformal radiotherapy is currently in the mainstream of external radiotherapy treatment. Starting with CT images of a cross-section of the tumour, a computer will generate a 3D model of the tumour and map out the treatment area. The depth of the tumour will be accounted for. Damage to normal cells will also be reduced.

However, if the tumour is highly irregular or sits too close to a vital organ, 3D mapping alone may not be enough to avoid normal tissues nearby. For example, with nasopharyngeal cancer (which typically encircles the cervical spine, situated next to the parotid gland), you may have to use techniques like intensity modulation, as listed below:

Intensity modulated radiotherapy (IMRT)

Used for: cancers of the head, neck, prostate, breast, cervix and rectum

Several beams are emitted at different angles and cross-sections at various intensities (doses) simultaneously to meet at the tumour site. The beam's

configuration is carefully calculated to treat tumours imbedded in normal tissues, or those situated near vital organs like the head and neck (see '3D conformal radiotherapy' above). A higher dosage can be used to remove more cancer cells, while reducing side effects at the same time.

Image guided radiotherapy (IGRT)

Used for: all cancer types

A course of IGRT treatment includes many daily sessions. No matter how thorough the pre-treatment preparations are, the position of the tumour relative to the beam won't be exactly the same in all sessions. Your body may shift and change somewhat during the treatment. The tumour may shrink after a few sessions as cancer cells die. More importantly, the tumour may shift because of bodily functions, such as a bowel movement.

Image guided radiotherapy takes into account the discrepancies between treatment time data and the pre-determined external beam radiotherapy configuration, making sure that the beam follows the tumour as it moves.

Respiratory gating

Used for: cancers of the lung, breast, liver, oesophagus

Tumours in the chest and upper abdomen shift constantly as you breathe. Infrared and other means can be used to gauge your respiratory cycle. Real time data can then be fed into the radiotherapy machine in order to adjust the beam.

For example, a beam is emitted only when you breathe in or breathe out, but shuts off during the rest of your respiratory cycle. This technique is used to treat cancers of the lung, breast, liver, and oesophagus.

Volumetric modulated arc therapy (VMAT)

Used for: cancers of the head, neck, prostate and uterus

Radiotherapy machines with VMAT-capabilities revolve around the patient once, or several times. The beam is adjusted as the tumour changes position to give an even dosage to the treatment area. This can also make the dosage match the shape of the tumour closely, causing less damage to normal surrounding tissues.

Stereotactic radiosurgery (SRS or X-Knife)

SRS is a high-intensity X-ray treatment used on a single occasion to remove a tumour once and for all. It's called 'radiosurgery' as the technique is as precise as using a knife to cut out a tumour at close range.

This is made possible by high-precision positioning instruments that can confine the beam to an area as small as 2mm. As this therapy uses radiation, no open wound is inflicted.

SRS is often used to treat benign and malignant tumours of the head and neck, including the brain. It's also used for patients not fit for, or unwilling to have surgery.

CyberKnife® and Gamma Knife® are two commercial versions of SRS.

Stereotactic radiotherapy (SRT), stereotactic body radiotherapy (SBRT) or stereotactic ablative radiotherapy (SABR)

SRT is like SRS, but conducted in batches. The total radiation dosage used in SRS is divided into several batches and used to treat small tumours of the nasopharynx, lungs, liver and spinal cord separately. The entire course of treatment can take up to three weeks.

Other than those above, there are special techniques like:

Total body irradiation (TBI)

Irradiation of the entire body using a high-energy beam (the chest will be shielded to protect the lungs and heart). TBI is often used in preparation for a stem cell transplant to treat cases of leukaemia (cancer of the blood). This will eliminate all the leukaemia cells and suppress the immune system to reduce the risk of the body rejecting the transplant.

Intraoperative radiotherapy (IORT)

During surgery on tumours, external radiotherapy may also be used to remove cancer cells on the fringe of the tumour.

Proton therapy

Used for: cancer of the lungs, liver, prostate, eyes and central nervous system (CNS), including the brain and spinal cord

Proton therapy uses proton beams (instead of X-rays) to irradiate the tumour. This method can be used in combination with surgery, traditional radiotherapy or chemotherapy. After penetrating the body's surface, a proton beam can temporarily withhold its energy and will only release it when the tumour is reached.

This can reduce damage to normal cells along the path of the beam before it reaches the tumour. Proton therapy is especially important for children whose organs and tissues are still developing.

This method is still developing and isn't readily available in Hong Kong at this stage.

Internal radiotherapy

Instead of shooting a beam at the tumour from outside the body, internal radiotherapy uses a radioactive source inside the body to destroy the tumour. There are two ways to do this:

1. Insert a radioactive substance into the body near the tumour through an opening (a process called brachytherapy)

2. Swallow or inject drugs containing radioactive material

The 'implant' method is the most common form of internal radiotherapy.

Brachytherapy

Brachytherapy is used mainly for tumours inside the body cavity that can be accessed from a body opening.

Weakly radioactive iridium, caesium or strontium atoms (called 'isotopes') are placed inside the body near the tumour to destroy it at close range.

A small, tightly-sealed container carrying weak radioactive iridium, caesium or strontium isotopes is inserted via a body opening in order to reach the tumour. To avoid the handling of radioactive materials by a human, a machine called a 'remote after-loading system' is used for this. Real-time X-ray or CT imaging can be used as a guide with which to place the isotopes as close to the tumour as possible. While the machine does its job, the patient is to lay still. The specialist will monitor the situation in a neighbouring room on a screen, or through a connecting window panel.

The radiation works only at short range, primarily affecting the tumour area. Damage to normal nearby cells is therefore kept to a minimum.

The radioactive source will be removed by the machine once the job is done. You can go home when the radioactivity of your body's surface falls to a safe level.

Cancers that can be treated in this way include those of the stomach, bladder

and uterus. For stomach cancer, the radioactive container is passed through the mouth and down the oesophagus to reach the tumour. For bladder cancer, the body opening is the urethra, and for uterine cancer, the opening is the vagina.

Brachytherapy can be used on its own, or in combination with external radiotherapy/surgery.

Our body only has a few body cavities. The majority of our tissues and organs are solid structures (like the liver and kidney) and don't have a nearby body cavity in which to hold the radioactive substance. External radiotherapy is therefore the mainstay of all radiotherapy.

Internal radiotherapy in drug form

Internal radiotherapy in drug form is also called 'radioisotope' or 'radionuclide therapy'. Drugs made of weak radioactive substances are taken orally, or injected into the vein (IV). This method isn't used as often as brachytherapy.

Examples include radioactive iodine (used to treat thyroid cancer) and radioactive strontium (used to reduce pain caused by cancer invading the bone).

When taking radioactive drugs, your bodily fluids and excretions will be slightly radioactive. This radioactivity may linger for a while after treatment.

Safety precautions

Brachytherapy

While receiving brachytherapy, you'll have a radioactive source in your body, so you will have to stay on an isolation ward. There may be lead shields around your bed. Visitors may talk to you in an adjacent room using a smart phone,

tablet device or video intercom.

After the radioactive source is removed from the body, you will remain on the isolation ward for a few more days to make sure that you're no longer radioactive.

Use of radioactive drugs

Your bodily fluids and excretions may harbour residual radioactivity when using radioactive drugs. Safety precautions are required to protect the people who live with you.

Before the radiation level of your bodily fluids and excretions returns to normal, you need to take safety precautions while at home to protect the people who live with you. We recommend the following:

- Store your health and hygiene products in a separate place
- Lower the toilet seat cover and flush twice after every use
- Take a shower instead of a bath
- Wipe the bathroom dry after each use
- Eat by yourself
- Use a separate set of cooking and culinary utensils
- Wash your clothes and tools separately
- Stay at home during treatment
- Keep distance between you and children and pregnant women
- Use a condom when having sex. Dispose of them carefully following the hospital's instructions

Make sure your home is not contaminated and prevent the people who live with you from coming across any radioactive residue.

A comparison of internal and external radiotherapy

Internal radiotherapy (primarily brachytherapy) is used to treat tumours located in a body cavity, such as your stomach, bladder, uterus, head and/or neck. This treatment is usually given only once or twice.

External radiotherapy is used for relatively large tumours that aren't necessarily in a body cavity. Treatment consists of many daily sessions over the course of a few weeks.

	Internal radiotherapy	External radiotherapy
Treatment method	Insert the radioactive source into a body cavity near the tumour; or, use drugs made of weak radioactive substances.	A machine emits a high -energy beam to irradiate the tumour from outside the body.
Types of cancer	For tumours located in a body cavity (e.g. head and neck, stomach, bladder or uterine tumours).	The tumour doesn't have to be in a body cavity. It can deal with a relatively large area.
Times of treatment	Usually a one-off treatment.	A course of treatment includes daily sessions (each taking a few minutes) that may last several weeks. Usually conducted in the outpatient department of a hospital.

In external radiotherapy, the high-energy beam travelling through the body will hurt normal cells in front of, and behind the tumour, causing side effects.

A course of external radiotherapy requires several weeks of daily irradiation sessions, each lasting a few minutes. Side effects usually appear a few weeks after the first session.

The high energy beam affects an area of no more than 10 cm in diameter. The skin where the beam enters and leaves the body will turn red and sore. As a result, the patient feels fatigue due to one's energy being used to repair the normal cells that are damaged.

Other than skin irritation and fatigue, side effects are limited to the part of the body receiving the beam. For example, there is hair loss while receiving treatment for head and neck cancer, or may experience nausea, vomiting, diarrhoea and/or constipation if an area near the stomach or bowel receives radiation. However, treatment for stomach cancer does not lead to hair loss, and head and neck cancer patients aren't likely to experience nausea or constipation/diarrhoea when receiving treatment.

The strength of each side effect depends on the type of cancer; its location and stage (spread); the intensity of the beam (radiation dosage); the type of radiotherapy machine; previous treatments issued (whether you've already been treated with surgery or chemotherapy); and, your general health condition.

Side effects can be relieved through medication, dietary adjustments or taking additional hygiene precautions during treatment, and will usually go away a few months after treatment ends.

Before giving consent to undergo radiotherapy, make sure you understand the possible side effects and how they can be relieved and managed.

Side effects of radiotherapy are generally relatively mild. Most patients continue their regular daily routines as usual while receiving treatment. If a certain side effect gets really intense, tell your doctor right away to see whether your dosage or treatment method needs adjusting.

To avoid a conflict of medication, show your doctor a list of the Western and Chinese therapies you're taking before starting radiotherapy, including any special dietary changes, nutrient supplements or alternative therapies.

Side effects common to most types of cancer

Fatigue

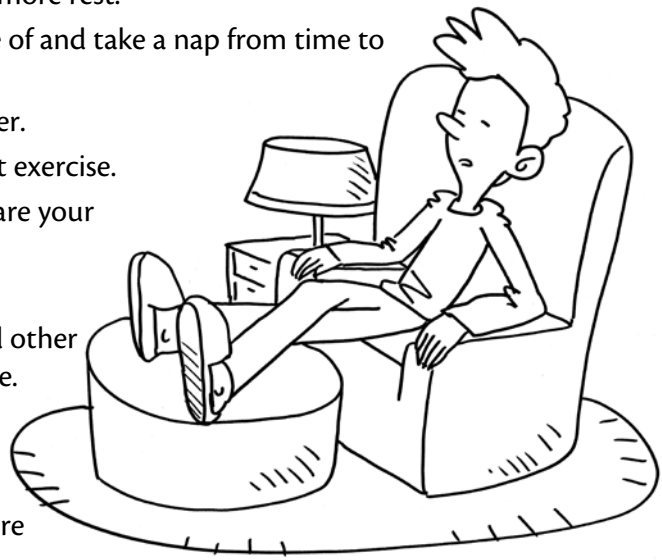
Fatigue is the most common side effect of radiotherapy. Repairing damage to normal cells requires energy. Daily trips to the hospital in order to receive treatment also adds to this fatigue. You're likely to feel sleepy, agitated and find it difficult to concentrate.

Often appearing two to three weeks after radiotherapy starts, fatigue will gradually subside a few weeks after treatment concludes.

General fatigue requires no medication. Just reduce your workload, rest more and eat well. If you have difficulty getting to sleep, ask your doctor for a prescription. Sleeping pills sold in drug stores may interact badly with radiotherapy.

Tips

- Adjust your schedule to get more rest.
- Only do tasks you're capable of and take a nap from time to time.
- Eat well and drink more water.
- Take a walk, or do some light exercise.
- Ask those close to you to share your responsibilities.
- Stay away from alcohol.
- Cut out coffee, black tea and other beverages containing caffeine. While stimulating in the short-term, caffeine will cause you to lose sleep in the long run, resulting in more severe consequences.



Suppressing blood formation

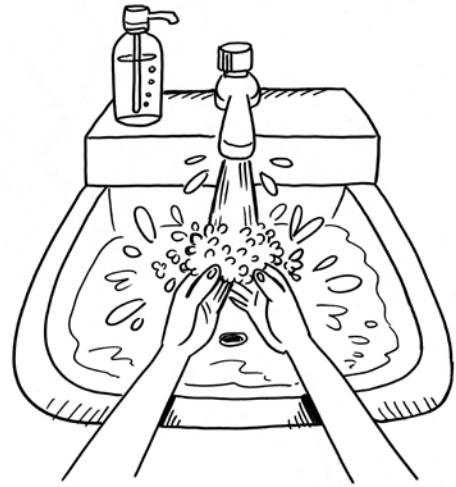
Radiotherapy may suppress your blood formation process, especially if a large area of your chest, abdomen, pelvis or thighbone is treated.

- A low red cell count will make you feel tired
- A low white cell count will make you vulnerable to infection
- A low platelet count will make it hard to stop bleeding when injured

Your blood count will be checked regularly throughout your course of treatment. If it gets too low, radiotherapy may be stopped until it returns to normal. A blood transfusion can also be given when necessary.

Tips

- If you have a low white cell count, avoid crowded places and keep your distance from people with a cold or fever.
- If you have a low platelet count, take extra care when handling sharp tools, such as shaving with a razor.
- Pay extra attention to your personal hygiene; wash your hands thoroughly after going to the toilet and before eating.



Skin irritation

A few weeks after radiotherapy starts, the area where the beam enters the body may turn red, feel itchy, start peeling or form blisters (similar to the effects of sunburn). The extent of the reaction depends on the intensity of the beam, and how sensitive your skin is to radiation.

Tips

- Instead of taking a shower or bath, wipe your body gently once per day with a sponge or soft cloth
- Use mild soap and warm water. Don't scrub the sensitive area
- Use moisturiser every day. Apply it when your skin is slightly wet
- Drink plenty of fluids
- Stay in a cool place

Skin problems usually go away two to four weeks after treatment ends. During treatment, these tips should help:

Tips

- Don't use medicinal skin products bought in drug stores. Ask your doctor for suggestions.
- Avoid aromatic hygiene products such as soap, talcum powder, anti-perspirant, skin lotion and perfume.
- Wear long-sleeves and put on a scarf, hat or umbrella when going outside. Protect your skin from direct sunlight and the wind.
- Wear loose clothes made of natural fibres. Avoid clothes with a tight collar.
- Shave with a razor instead of a blade.
- Give your breast more room after it receives treatment. If you have to use a bra, find a garment that's one size too big and contains no metal wire.

Lymphoedema

Lymphoedema is a common side effect of radiotherapy for breast cancer that can appear months, even years after treatment. Irradiating cancer-affected lymph nodes near the armpit may cause swelling to the arms because of a build-up of fluid in blocked lymph vessels. This swelling could hamper movement.

Tips

- Don't lift heavy objects.
- Wear loose clothes.
- Avoid massages.
- Do light exercises (as suggested by yourdoctor) to aid lymph circulation.

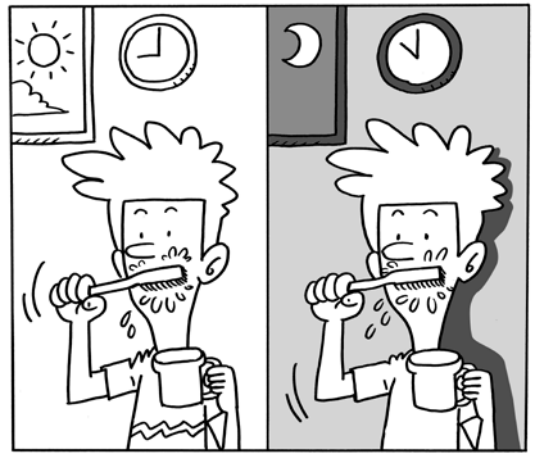
Side effects of radiotherapy to the head or neck

Tooth decay

Radiotherapy to the head, mouth or face may affect your salivary gland. Your teeth will be vulnerable to decay because of a lack of saliva. Pre- and post-treatment dental check-ups are necessary. Tell your dentist that you've had radiotherapy to the head before you receive dental treatment. Tooth extraction is not recommended within the first year after radiotherapy.

Tips

- Brush your teeth after waking up and before going to bed. Use a soft toothbrush and a mouthwash suggested by your doctor
- Use fluoride-based dental products
- If you develop a dry mouth, sip water regularly. Consume a soft diet, containing foods like noodle soup
- Rinse your mouth with a spoonful of salt in a cup of warm water at least once per day



- Use saliva spray as prescribed by your doctor
- Cut out smoking and alcohol during treatment. Quit smoking altogether if you can

Mouth sores

Besides the possibility of tooth decay, your mouth may become dry and sore due to a lack of saliva. Tell your doctor if you find it difficult to chew/swallow, or have oral thrush/thick phlegm caused by an infection. This situation may last several months after treatment ends.

For further details, see the 'Tooth decay' section (above).

Change of taste

Lack of saliva may also affect your taste, making foods taste strange (often metallic) or lose their taste altogether. It may take up to a year for your sense of taste to return to normal.

Aside from the tips listed in the 'Tooth decay' section, you can always use the tips below, or download our free 'Diet and Cancer' booklet here: **https://www.cancer-fund.org/en/cancer-booklets-2/**

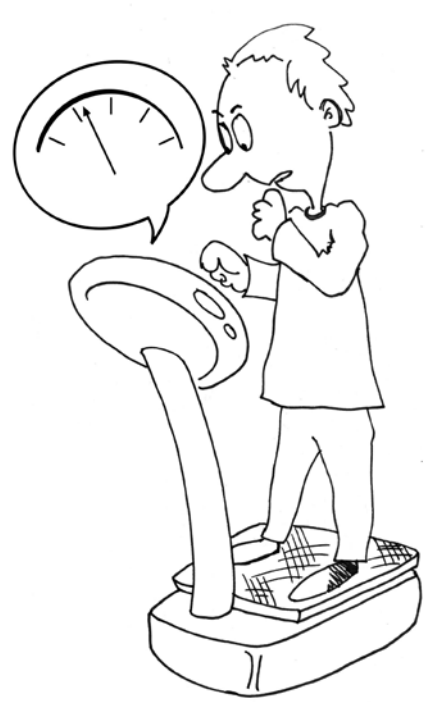
Tips

- Add garlic, onion, cheese, celery, herbs and spices to your food to enhance the taste.
- Drink fruit juice while eating, or use honey to reduce a bitter taste. If red meat tastes bitter, eat chicken, fish, dairy products, eggs, peanut butter or bean-based products instead.

- Use plastic containers to handle food and drink to reduce the metallic taste. Food with a mild sour taste (like fruit juice) may help too.

Loss of appetite/weight loss

Mouth discomfort can make you lose your appetite, and eventually lose weight. If you don't feel like eating, try prescription high-calorie drinks. If swallowing is a problem, a flexible tube can be inserted into your nose and down into your stomach to enable you to take on liquid food. If the problem persists, a feeding tube can be installed into your stomach through an opening in your abdomen.

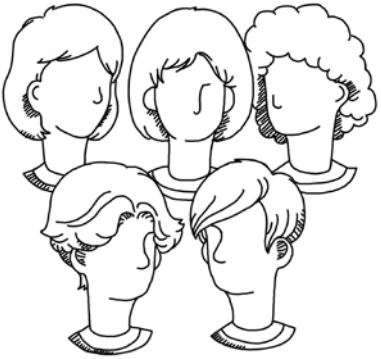


Tips

- If you don't feel like eating, try snacking often. Also, have nutritional supplement drinks in between snacks
- Carry snacks with you at all times
- Use whole milk to prepare soup and oatmeal
- Use high-protein milk to prepare desserts
- Add sugar, syrup, honey or glucose to your drinks and fruit

Hair loss

Hair is the fastest-growing tissue in your body, and therefore easily affected by radiotherapy to the head. You might start to lose hair a few weeks after the treatment starts. Hair on other parts of your body won't be affected.



Hair loss affects appearance more than health. Some patients cut their hair short before treatment to avoid cleaning up hair that could be shed widely over the course of treatment.

New hair will appear a few months after radiotherapy, but may not look the same as before. For example, once straight hair may become curly.

In the meantime, use a hat, scarf or wig to protect your head from the sun, wind and air conditioning. To match your natural hair colour, look for a wig before your treatment starts. If your eyebrows or eyelashes fall out, try cosmetic products (as recommended by your doctor).

Tips

- Use unscented shampoo and warm water when washing your hair. Protect the area where the beam enters and exits on your scalp. Gently pat it dry. Avoid hair dryers, gels or clips.
- Tell your doctor if the treatment area on your scalp hurts.

Read our 'Hair loss' booklet

Voice changes

Radiotherapy for cancer of the larynx may make your voice hoarse or husky, or even cause you to lose your voice altogether while undergoing treatment. Your voice will usually come back about one year after treatment concludes, but you may not sound the same.

Radiotherapy to the head and neck (rather than the larynx specifically) may also change your voice slightly. In such cases, your voice should return to normal a few weeks after treatment ends.

Tips

- Use a smart phone, tablet device or notebook and pen to communicate. Ask to be referred to a speech therapist if necessary.

Teeth clenching

Radiotherapy near your mouth may cause fibrosis of nearby muscle. This could cause your jaw to become stiff. With nasopharyngeal cancer treatment, teeth clenching may occur for several months after radiotherapy has finished.

Tips

- Learn exercises involving opening and closing your mouth soon after radiotherapy starts.

Mouth and neck muscle discomfort

Radiotherapy to your mouth or neck may cause nearby muscles to become stiff. Muscles in your cheeks used to chew food, and those around the neck may develop a slight spasm or pain a few months after radiotherapy starts. This situation can remain for a period of time.

Tips

- Learn exercises that work the muscles in your cheeks and around the neck soon after treatment starts.

Difficulty in swallowing

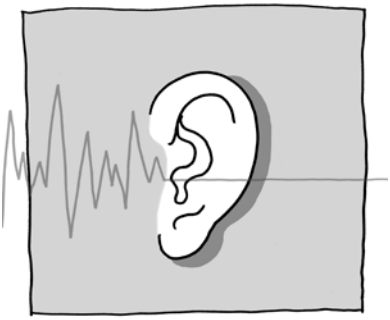
With radiotherapy to the head and neck, your throat may swell and feel sore a few weeks after treatment starts, making it difficult to swallow solid food. This side effect can be even more pronounced when radiotherapy is used

in combination with chemotherapy. Painkillers or aspirin mouthwash can be prescribed as relief.

The pain should gradually subside five to eight weeks after treatment ends.

Tips

- Instead of eating a full meal, try snacking little and often. Avoid dry, spicy, fried or very hot food. Stop smoking and drinking alcohol.
- Drink plenty of water. Use high-calorie drinks or supplements.
- Try various foods to find ones that are easier for you to swallow.



Hearing loss

The Eustachian tube (or, 'auditory tube') is a small passage connecting your throat and middle ear. It may become blocked due to infection caused by radiotherapy to your head or neck. As treatment goes on, you may experience discharge, ringing in your ear or poor overall hearing. Medication can be prescribed to reduce the infection.

Tips

- Repeatedly exercising this area by closing your mouth and swallowing can help get air into your ear and open up the Eustachian tube.

Increase in brain pressure/intracranial pressure (ICP)

Radiotherapy to the brain may give you headaches, nausea and vomiting due to temporary swelling of the brain, which is caused by high levels of pressure.

Tips

- Steroids can be prescribed to relieve the swelling.

Common side effects of radiotherapy to the chest and abdomen

Nausea and vomiting

Radiotherapy near the stomach, or in combination with chemotherapy, can make you experience nausea or vomiting. This effect is generally mild and will gradually go away after treatment ends. Antiemetics may be prescribed for nausea relief.

Tips

- Eat at least two hours before each radiotherapy session. Wait for two hours after session before your next meal.
- Instead of a full meal, try snacking little and often. Avoid greasy and fried food.
- Sip water regularly to make up for the fluids lost through vomiting.
- Use high-calorie drinks to make up for the loss of nutrients if necessary.

Shortness of breath

Radiotherapy to the chest may cause fibrosis, or an infection of the lung, a few months after treatment starts, giving you a dry cough and/or shortness of breath. Antibiotics or steroids may be prescribed as relief.

Tips

- Tell your doctor right away if you experience any change in your breathing.

Side effects of radiotherapy to the pelvis

Diarrhoea/stomach bloating (abdominal fullness)

Radiotherapy near the abdomen or pelvis, especially the colon or rectum leading to the anus, may give you diarrhoea, stomach cramps or bloating. Anti-diarrhoeal medication can be prescribed for relief. Diarrhoea should go away several weeks after treatment ends. Tell your doctor if it doesn't get better within this time.

Tips

- Instead of a full meal, try snacking little and often. Adopt a low-fibre diet.
- Drink more water to make up for fluids lost and rest more often.
- Stop consuming alcohol, coffee, dairy products, high-fat/high-fibre foods, oranges, black date juice and spicy foods.

Constipation

Radiotherapy to the prostate or bladder may irritate your lower abdomen and rectum, causing constipation or haemorrhoids. Tell your doctor if you find any sticky fluid or bleeding in your anus.

Tips

- Drink more water and adopt a low-fibre diet.
- Moderate exercise and maintaining a relaxed mood may help aid bowel movements.

Pain when urinating

Radiotherapy to the lower abdomen may cause an infection in your bladder. This can give you a burning sensation when urinating, cloudy urine that smells

different and an urge to urinate frequently (though, you're not able to fully empty your bladder). If there's blood in your urine, see your doctor right away. Antibiotics may be prescribed for relief.

Tips

- Drink more water. Stop consuming coffee, tea, alcohol and orange juice.

Incontinence

Radiotherapy to the lower abdomen may irritate your bladder, causing it to leak urine when you laugh, sneeze, cough or exercise. Medication may be prescribed for relief.

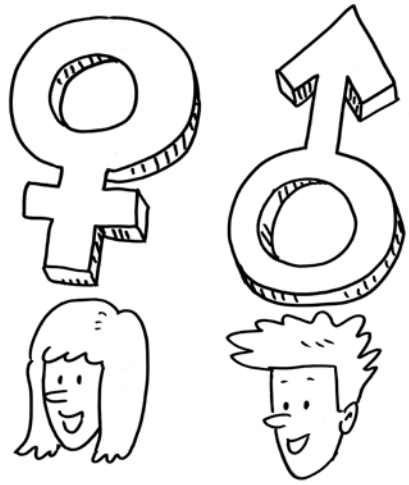
Tips

- Do pelvic floor exercises to strengthen the muscle around your anus.
- Ask your doctor how to adjust your fluid intake to ease the problem.

Female sexual problems

Radiotherapy to the pelvis can affect your ovaries. A few months after treatment starts, you may experience menopause-like symptoms, such as hot flushes, dry skin, dry vagina, irregular periods, or even no period. Hormone medication may be prescribed as relief. After treatment ends, your period is likely to return to normal. However, the possibility of undergoing menopause cannot be ruled out.

Radiotherapy close to the vagina may cause it to tighten up, resulting in pain during intercourse. Doctor may suggest you use a dilator to prevent the vaginal wall from collapsing and lubricant may be used to help the vagina regain its elasticity.



As with most side effects, problems with your vagina are only likely to be temporary. Things should return to normal gradually after treatment concludes. Tell your partner and/or consult with your doctor if you're worried.

Tips

- Try lubricant if there's pain during intercourse.
- Having sexual intercourse regularly may help to prevent your vagina from tightening.

Male sexual problems

Radiotherapy to the lower abdomen may cause a male to lose interest in sex during treatment. The fatigue caused by treatment combined with concern over the potential consequences of cancer can prevent men from getting an erection. Things will hopefully return to normal after treatment concludes.

Tips

- Your doctor may be able to help with your erection problem during treatment.
- Speak to your partner about the problem, as well as your doctor.

Sex and fertility

Radiotherapy only impacts on peoples' sex lives or fertility when used to treat the lower abdomen. For example, irradiating the ovaries will make you unable to get pregnant, while treating the testicles will lower your sperm count (even

after treatment concludes).

More importantly, couples should avoid pregnancy while the lower abdomen receives radiotherapy.

Tell your doctor before treatment starts if you plan to have children. Bring your partner along, too. You may have to discuss saving sperm or eggs for use after treatment.

Our CancerLink support centres have helped many people with regards to fertility. You're welcome to pay us a visit or call us on 3656 0800.

Tips

- If you wish to have children after radiotherapy, save some of your sperm or eggs before radiotherapy begins.

Doctor, can I ask you...?

Before going to the doctor to learn about your diagnostic report and treatment options, write down all your worries.

Ask a family member or close friend to come along so they can help take notes and remind you of the questions you want to ask. If you're not sure what your doctor means, ask your doctor to repeat themselves using everyday language.

In Hong Kong, you need prior consent from your doctor or the hospital to make an audio or video recording of the consultation, and both have the right to decline your request. A public hospital will then have to obtain approval from the Hospital Authority.

Here are some of the questions people frequently ask:

1. Would radiotherapy remove the cancer and achieve a cure, or just control the spread? Why is radiotherapy the first choice?

2. Will I be given external or internal radiotherapy? If external, which type of machine will be used? Why this machine? How long will the course of treatment be? How long is each daily radiation session?

3. Is there another option? If so, why is this not as good as radiotherapy?

4. You suggest that I have surgery followed by radiotherapy to prevent the cancer coming back. How much better would this be than having radiotherapy alone?

5. Will there be any discomfort during treatment? Do I have to adjust my daily routine or diet?

6 How do we know whether radiotherapy works?

7. What are the possible side effects? How strong would they be? Could they affect my appearance, daily life, relations with my family and partner? How can they be dealt with?

8. What is the chance of relapse after radiotherapy? If I don't opt for radiotherapy, will the tumour spread out and relapse?

9. How much would this treatment cost?

10. Could I live life as usual after radiotherapy?

Follow-up

Cancer cells damaged by radiation take time to die. After a few daily sessions, the tumour may still be growing. Only near the end of the treatment will you see that the tumour has shrunk.

You will need regular check-ups after treatment. Your doctor will tell you how often you have to come back. However, as you get better, you'll require check-ups less frequently. Keep a record of your condition. If there's a change in your condition, tell your doctor. Don't wait. Make sure it's taken care of.

Long-term side effects

As with any treatment, radiotherapy comes with its own risks and side effects. Some side effects may linger on for a long time. The extent of the problem depends on the type of cancer, its stage (spread) and the area of treatment. Your doctor will help you deal with possible long-term effects, including:

- Inflammation of the gums and tooth decay.
- Hard and/or tight patches on the skin (skin sclerosis), or a change in skin pigmentation.
- Ringing in the ears (tinnitus), chronic middle ear infection, hearing loss or even deafness.
- Lymphoedema (swelling of the limbs).
- When the lung, breast, skin, vagina, oesophagus etc. receives radiation, tissues nearby may harden or shrink (fibrosis).
- Bones become fragile and vulnerable to cracking.
- Infertility.

CancerLink support centres conduct regular rehabilitation workshops and peer support groups, both of which are free of charge. We want to help you to face the treatment with a positive attitude. Our vision is to ensure that no one faces cancer alone. Please call our service hotline on 3656 0800 to register.

Your feelings

Understandably, most people feel overwhelmed when they are told they have cancer. Many different emotions arise that can cause confusion and frequent mood changes.

This does not mean, however, that you are not coping with your illness. Reactions differ – there is no right or wrong way to feel. These emotions are part of the process that many people go through in trying to come to terms with their illness. Partners, family members and friends often experience similar feelings and frequently need as much support and guidance in coping with their feelings as you.

Shock and disbelief

"I can't believe it!" "It can't be true!"

This is often the immediate reaction when cancer is diagnosed. You may feel numb, unable to believe what is happening or to express any emotion. You may find that you can take in only a small amount of information and so you have to keep asking the same questions over and over, or you need to be told the same bits of information repeatedly. This need for repetition is a common reaction to shock. Some people may find their feelings of disbelief make it difficult for them to talk about their illness with their family and friends, while others feel an overwhelming urge to discuss it with those around them; this may be a way of helping them to accept the news themselves.

Anger

"Why me?" "Why now?"

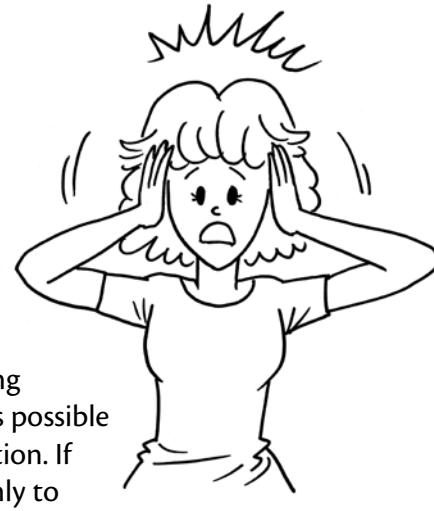
Anger can hide other feelings, such as fear or sadness, and you may vent your anger on those who are closest to you and on the doctors and nurses who are caring for you. If you hold religious beliefs you may feel angry with your god.

It is understandable that you may be deeply upset by many aspects of your illness, so you should not feel guilty about having angry thoughts or being irritable. However, relatives and friends may not always realise that your anger is really directed at your illness and not at them.

If you can, it may be helpful to tell them this at a time when you are not feeling quite so angry or, if you find that difficult, perhaps you could show them this booklet. If you are finding it difficult to talk to your family, it may help to discuss the situation with a trained counsellor or psychologist. Hong Kong Cancer Fund can give you details on how to get help in your area. Call our service hotline on 3656-0800.

Denial

"There's nothing really wrong with me!"
"I haven't got cancer!"



For many people, not wanting to know anything about their cancer, or wishing to talk as little as possible about it, is the best way to cope with the situation. If that is the way you feel, then just say quite firmly to

the people around you that you prefer not to talk about your illness, at least for the time being.

Sometimes, however, it is the other way round. You may find that it is your family and friends who are denying your illness. They appear to ignore the fact that you have cancer, perhaps by playing down your anxieties and symptoms or deliberately changing the subject. If this upsets or hurts you because you want them to support you by sharing what you feel, try telling them how you feel. Start perhaps by reassuring them that you do know what is happening and that it will help you to talk to them about your illness.

Fear and uncertainty

"Am I going to die?"
"Will I be in pain?"

Cancer is a frightening word surrounded by fears and myths. One of the greatest fears expressed by almost all people who are newly diagnosed is: "Am I going to die?"

Some people with cancer may be cured, but even if your cancer is not curable there are things that can be done to help you, both to relieve any pain or discomfort and to control the disease for some time. There is also help available to cope with the emotional aspects of cancer.

"Will I be in pain?" and "Will my pain be unbearable?" are other common concerns. In fact, some people with cancer experience no pain at all. For those who do, there are many drugs and other techniques that are successful at relieving pain or keeping it under control.

Most people are anxious about their treatment: whether or not it will work

and how to cope with the possible side effects. It is best to discuss your individual treatment in detail with your doctor.

Often you will find that doctors are unable to answer your questions fully, or that their answers may be vague. It is often impossible to say for certain that the cancer has been totally eradicated. From past experience doctors may know approximately how many people will benefit from a certain treatment; however, it is impossible to predict the future for individuals. Many people find the uncertainty hard to live with, and this can be disturbing for them.

Uncertainty about the future can cause a lot of tension, but fears and fantasies are often worse than the reality. Fear of the unknown can be terrifying, so acquiring some knowledge about your illness can be reassuring, and discussing your findings with your family and friends can help to relieve the tension caused by unnecessary worry. You may gain authoritative medical information on the internet (make sure that the sources are reliable and accurate), or you may share your experiences with those who also have cancer.

Read booklet to cope with your emotion

Blame and guilt

"If I hadn't... this would never have happened."

Sometimes people blame themselves or other people for their illness, or they try to find reasons for why it has happened to them. This may be because we often feel better if we know why something has happened. However, as doctors rarely know exactly what has caused your

cancer, there is no reason for you to blame yourself.

Resentment

"It's all right for you, you haven't got to put up with this."

Understandably, you may be feeling resentful and miserable because you have cancer while other people are well. Similar feelings of resentment may occur from time to time during the course of your illness and treatment for a variety of reasons.

Relatives, too, can sometimes resent the changes that your illness makes to their lives.

It is usually helpful to bring these feelings out into the open so that they can be aired and discussed. Bottling up resentment can make everyone feel angry and guilty.

Withdrawal and isolation

"Please leave me alone."

There may be times during your illness when you want to be left alone to sort out your thoughts and emotions. This can be hard for your family and friends who want to share this difficult time with you. It will make it easier for them to cope, however, if you reassure them that although you may not feel like discussing your illness at this time, you will talk to them about it when you are ready.

Sometimes an unwillingness to talk can be caused by depression. You can discuss this with your doctor, who can prescribe a course of antidepressant drugs or refer you to a doctor who specialises in the emotional problems of those with cancer. It is quite common for people with cancer to experience depression and there is no need to feel you are not coping if you need to ask for help.

Learning to cope

After any treatment for cancer it can take a long time to come to terms with your emotions. Not only do you have to cope with the knowledge that you have cancer but also the physical effects of the treatment.

Cancer treatment can cause unpleasant side effects but some people do manage to lead an almost normal life during their treatment. You likely will need to take time off for your treatment and some time afterwards to recover. Just do as much as you feel like, and try to get plenty of rest. Do not see it as a sign of failure if you have not been able to cope on your own. Once other people understand how you are feeling, they can be more supportive.

Who can help?

The most important thing to remember is that there are people available to help you and your family. Often it is easier to talk to someone who is not directly involved with your illness. You may find it helpful to talk to a counsellor who is specially trained to offer support and advice. Staff at Hong Kong Cancer Fund are always willing to discuss any problems that you might have and can put you in touch with a counsellor or a support group. Call us on 3656 0800 for more information.

Hong Kong Cancer Fund service network

Our five CancerLink support centres and seven cancer patient resource centres in major public hospitals provide free counselling, support and information to those in need. Together they form a seamless service network that meets the needs of people at different stages of their cancer journey.

- **CancerLink support centres**

  We have five support centres outside the hospital setting that cater to the specific needs of those with cancer throughout the different stages of their illness. The centres – located in Central, North Point, Wong Tai Sin, Tin Shui Wai, and Kwai Chung – offer well-designed, holistic rehabilitation programmes that emphasise individual needs.

  We also provide backing to 22 support groups, helping them to share resources so as to offer the best services to people living with cancer and their families. Our volunteer groups, formed by cancer survivors, pay visits to hospitals to provide emotional relief. More than 18,000 participants have joined our support network, which is divided into three groups – one for those with cancer, another for those with specific types of cancer (such as breast cancer, colorectal cancer and nasopharyngeal cancer), and another group for English speakers.

Care specialists – including registered social workers, registered nurses, registered dietitians, art therapists, counsellors and professional volunteers – are available to provide support, information and specialised services.

Private and family counselling is conducted by registered professionals to help those touched by cancer, their families and caregivers deal with the different emotional aspects experienced over the course of treatment.

There are also programmes and rehabilitation classes to develop coping skills, relaxation classes to help relieve mental and physical stress, and dietetic support to provide advice on nutrition.

Our comprehensive range of wellness programmes and therapeutic workshops helps users relax, tackle negative emotions, relieve stress, and restore confidence. We provide free classes, ranging from yoga and meditation to horticulture and insomnia management. The centres also feature well-stocked libraries.

"I managed to go through treatment but was worried about a relapse. A feeling of loneliness was haunting me. I felt especially grateful to have my support group, the members of which stood by me all the time."

CancerLink support centre user

This booklet is published by Hong Kong Cancer Fund, 2019.

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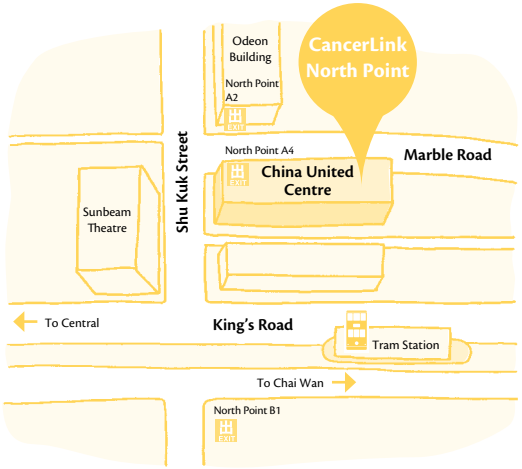
The contents of the booklet are correct as of print

Hong Kong Cancer Fund CancerLink support centres

CancerLink Central

Unit 5, Ground Floor, The Center,
99 Queen's Road Central,
Hong Kong
(MTR Sheung Wan Station Exit E1/E2)

Email: canlinkcentral@hkcf.org



CancerLink North Point

2201-03, China United Centre,
28 Marble Road,
North Point, Hong Kong
(MTR North Point Station Exit A4)

Email: canlinkcentral@hkcf.org

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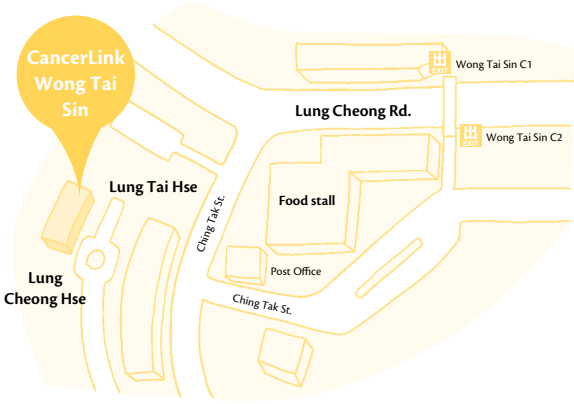

CancerLink Wong Tai Sin

Unit 2-8, Wing C, G/F,
Lung Cheong House,
Lower Wong Tai Sin (II) Estate,
Kowloon
(MTR Wong Tai Sin Station Exit C2)

Email: canlink@hkcf.org

CancerLink Tin Shui Wai

Shop 201C, 2/F,
Fortune Kingswood Phase 2,
12-18 Tin Yan Road,
Tin Shui Wai, New Territories
(Light Rail Ginza stop)

Email: canlink-tsw@hkcf.org

CancerLink Jockey Club Support Centre, Kwai Chung

3/F, TLP132, 132-134 Tai Lin Pai Road, Kwai Chung, New Territories (MTR Kwai Fong Station Exit A)

Email: canlink-kcc@hkcf.org

Green Minibus Station
(Kwai Chung Road)

94, 302, 313

Kwai Fong Estate Bus Station
(Kwai Chung Road, opposite to Kwai Fong Estate/Outside Yee Lim Factory Building)

237A, 265M, 269A, 269M, 290, 290A, 33A, 36A, 38A, 40, 46P, 46X, 57M, 59A, 61M, 935

Kwai Fong Estate Bus Station
(Kwai Chung Road, near Kwai Yik Road)

240X, 260C, 265M, 269M, 46P, 46X, 47X, 57M, 58M, 58P, 59A, 67M, 269P

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Hong Kong Cancer Fund

Service hotline: 3656 0800
Donation hotline: 3667 6333
Website: www.cancer-fund.org

Cancer booklets


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