





WHAT IS CANCER?

The human body is composed of all sorts of cells that make up the different tissues and organs that comprise a human being. These cells are managed by **genes** (the basic building blocks of cells, which determine individual features like eye colour). Genes act like conductors, guiding the cells along from the moment they appear to their eventual demise. Our bodies are thus programmed to prevent the growth of defective cells—the gene either repairs the defect or eliminates the cell.

With cancer, defects (mutations) build up, and the cells fail to respond to the signals sent by the conductors (genes). In many cases, the cells also develop ways of getting around the body's defences (i.e., the immune system).

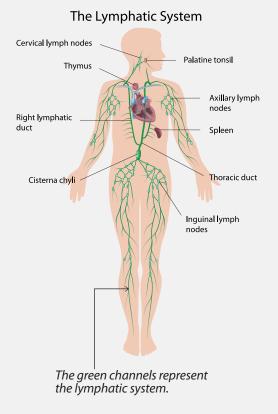
Cancer is actually the rapid growth of abnormal (defective) cells. These cells live longer and develop much faster than normal cells, creating a mass of abnormal cells we call a "tumour."

Cancerous cells sometimes travel from their original site and settle in other organs. We call that "metastasis." When a tumour creates a metastasis in another organ, it isn't creating another cancer, it is actually spreading the same cancer throughout the body.

Metastases can develop in a number of ways:

HOW DO CELLS TRAVEL?

- 1 Cells circulate through the lymphatic system, a network that carries the cells that defend the body. This network includes what are called nodes (areas where defensive cells are created), where cancerous cells may settle.
- Cells circulate in the bloodstream.
- Cells develop in healthy tissue around the tumour.



WHAT ARE THE RISK FACTORS?

The appearance of cancer generally involves a number of risk factors. The illness can occur many years after exposure to a risk factor. Cancer is not contagious. Certain risk factors can be modified (i.e., their effect can be diminished), while others cannot. Exposure to carcinogenic chemicals (asbestos), biological agents (viruses), radioactive materials, or environmental contaminants are also risk factors.

Risk factors

MODIFIABLE	NON-MODIFIABLE
 Tobacco use Poor diet Sedentary lifestyle/lack of exercise Alcohol consumption Obesity Exposure to UV rays 	 Age, especially after 65 Nationality (certain types of cancer are more common in certain populations) Heredity (genes) Personal history of cancer (there is greater risk of developing a second cancer)

HOW CAN CANCER BE PREVENTED?

A healthy lifestyle can help prevent a number of types of cancer. So what does a healthy lifestyle mean? Here are some simple, useful tips:

1. QUIT SMOKING

- Cigarette smoking is responsible for 1/3 of all cancers, and it doesn't just affect the lungs. It also frequently causes cancer of the throat, mouth, bladder, and liver.
- 2. FOLLOW CANADIAN'S FOOD GUIDE
- 3. MAINTAIN A HEALTHY WEIGHT AND EXERCISE EVERY DAY (30-45 MINUTES)

4. LIMIT YOUR EXPOSURE TO UV RAYS

- Use broad spectrum sunscreen (SPF ≥30)
- Avoid tanning beds

5. TAKE VITAMIN D SUPPLEMENTS

 In northern countries, taking 1000 UI of vitamin D per day during the fall and winter months may help prevent certain types of cancer.
 Talk to your healthcare professional to see if a supplement is right or necessary for you.

Vaccination

1. VACCINATION AGAINST HPV (HUMAN PAPILLOMAVIRUS)

Vaccination is useful in preventing cancer of the cervix, vulva, vagina, and anus. The vaccine is included in Quebec's vaccination program for girls at age 9, but women up to age 45 can also get vaccinated.

Males 9 to 45 may also benefit from protection against HPV. Being protected against cancer of the anus and having a lower risk of transmitting HPV through sexual relations are significant benefits.

2. VACCINATION AGAINST HEPATITIS B

The Hepatitis B virus can contribute to the development of liver cancer, though it is not the only cause. This vaccine is currently included in Quebec's vaccination program for teens in the fourth year of secondary school.

HOW CAN CANCER BE DETECTED EARLY?

Cancer can be detected in the early stages through screening. The patient can then start treatment right away, which greatly increases the chances of survival. Your healthcare professional can recommend specific screening tests.

DIAGNOSIS

In Canada, 2 out of every 5 people are expected to get cancer over the course of their lifetime, and 1 out of every 4 people to die of cancer.

Most commonly diagnosed types of cancer:

MEN	WOMEN
Prostate	Breast
Lung	Lung
Colorectal	Colorectal

The appearance of symptoms may lead to a visit to the family doctor or a trip straight to the emergency room. Patients undergo routine physical examination, screening tests, and bloodwork. There are many steps to go through before cancer can be diagnosed.

If your doctor has any reason to suspect cancer, you will be referred to the appropriate specialist. The process from your initial visit to diagnosis can seem long. However, it is important to thoroughly examine every possible cause to arrive at the correct diagnosis.

MANAGEMENT

Once the type of cancer is known, the **management phase** begins. A **multidisciplinary team** will take you in hand. This team will be made up of a number of different healthcare professionals. Each will be from a different field of specialty in order to provide you with better overall care.

Multidisciplinary teams may include the following professionals*:

Hematologist- oncologist/ Radiation- oncologist	Medical specialist in cancer treatment through chemotherapy (hematologist-oncologist) or radiotherapy (radiation-oncologist)
Nurse navigator	 Your contact Assesses all your needs and those of your loved ones Educates and provides information Offers guidance and support Helps organize care and appointments
Pharmacist	 Medication specialist Analyzes and prepares treatments Informs about and manages side effects and treatments Manages drug interactions Advises the hematologist-oncologist when necessary
Nutritionist	 Nutrition specialist Assesses your nutritional requirements Helps manage your weight Assists you in having a balanced diet
Psychologist/ Psychiatrist	Emotions specialistListens and offers supportHelps manage emotions
Social worker	 Works in the field of social intervention Provides support on many levels Financial Relationships Family Psychology Helps improve quality of life

^{*} This is not an exhaustive list. Many other professionals may work with the team.

TREATMENT

Once the diagnosis has been made, a treatment will be recommended for the patient's specific type of cancer. After discussion with the hematologistoncologist or radiation-oncologist, a basic treatment plan will be laid out. It is crucial for the patient to be involved to ensure he or she understands what has been decided and plays an active role in the process.

Various treatment options are available depending on the type of tumour, including its size and location and the presence or absence of metastases or related symptoms (e.g., pain, cough, fractures, difficulty swallowing). Other factors will also be taken into account to arrive at the decision that offers the most benefits while presenting the lowest risk for the patient.

Two patients with the same type of cancer may undergo very different treatment programs. The way patients react to treatments and the side effects they report can also differ widely. Remember that every patient is unique and that every case of cancer is as well.

Unfortunately cancer cannot always be cured. If a full recovery is not foreseeable, the treatment will seek to extend the patient's survival time and maintain quality of life for as long as possible.

Types of treatments

Different therapeutic options are available, and a combination of them may be in order.

Surgery	An operation consisting of removing the tumour and/or metastases and/or cancerous nodes.
Chemotherapy	The administration of medication that destroys cancerous cells. This medication can be administered in the form of pills, injections, or creams.
Radiotherapy	The tumour site is exposed to radiation. For this type of therapy to be effective, the irradiated area has to be larger than the size of the tumour.
Brachytherapy	Radiotherapy administered inside the body, directly at the site of the tumour.
Targeted therapy	Medication administered as a pill or injected into the bloodstream to slow or stop the growth and development of cancer cells.
Hormone therapy	Certain cancers depend on the presence of hormones in the body. These types of drugs, administered as pills or injections, alter the body's production of hormones.
Immunomodulators	This type of medication prompts the immune system to defend itself against cancer cells.

Transplant	This is used to treat blood cancers. It involves injecting normal blood cells into the bloodstream after purposefully destroying all cells (cancerous or not) in the patient's bone marrow. Bone marrow can be found in the spinal column, where blood cells are formed.
Research protocol	Oncology is a constantly evolving science. When all known treatment options for a cancer have been exhausted, a research protocol may be suggested. These are treatments whose effectiveness is not yet fully known, but whose basic safety has been established (i.e., the side effects are understood).

SIDE EFFECTS

Side effects are major concerns for most patients undergoing cancer treatment. Rather than learning about every possible side effect, patients should be aware that there are many ways of preventing and managing them.

Depending on the severity of the side effect, the treatment team may adjust your treatment, reschedule a session, or add a medication to prevent the side effect from reappearing at the next treatment. The goal is to allow you to complete the treatment to the fullest extent possible. Again, remember that every patient is different, and that the reaction to a given treatment can vary widely from one person to the next.

See the "Monitoring Side Effects" quick tips in this guide to learn when to contact your healthcare professional.

In the next section, we will look at the side effects of the 2 most common types of treatment—chemotherapy and radiotherapy.

1. Side effects of chemotherapy

The side effects of chemotherapy are, for the most part, caused by the destruction of rapidly developing cells. Many of the body's normal cells develop at a rapid pace. Unfortunately, chemotherapy does not distinguish between good and bad cells, so it kills off healthy cells too. Rapidly developing cells are found in the hair, the digestive system, and the skin. The destruction of these cells accounts for most of chemotherapy's side effects.

IMPORTANT! INFORM YOUR HEALTHCARE PROFESSIONAL:

- Of any side effect or unease.
- If you notice symptoms getting worse or becoming more difficult to control.



Nausea and vomiting

Chemotherapy makes you vulnerable to nausea, but a number of factors are also involved, including:

Treatment-related factors:

Not all treatments are as likely to cause nausea and vomiting. In fact, treatments are classified according to their risk of doing so.

Individual factors:

- History of nausea during pregnancy
- · History of nausea after receiving an anaesthetic
- History of nausea during previous sessions of chemotherapy
- · Susceptibility to motion sickness
- Being under the age of 50
- · Being female
- The type of cancer, since the illness itself can make a patient predisposed to nausea (e.g., cancer of the stomach or pancreas)
- Taking certain medication

Nausea isn't always prevented or treated in the same way. How it is treated will depend on when it occurs after the first day of treatment and its duration.

PREVENTION

- Medication may be prescribed for you to take regularly before or after treatment—it is important to follow dosage schedule to get the nausea under control.
- Eat what you want and only as much as you want—don't force yourself.
- Eat small, light, frequent meals.
- Avoid very spicy, very fatty, or strong-smelling food.
- Rest after your treatment.
- Get plenty of sleep the night before your treatment so your strength is up.

TREATMENT

- You will be prescribed medication.
 Be sure to take it as soon as you start feeling nauseous. If you wait, the nausea may last longer and be more difficult to treat.
- In addition to preventive action,
 - eat dried and lightly salted food.
 - consume juice and broths.
- drink rehydration liquids if you vomit.
- Avoid lying down for the first two hours after eating, to help with digestion.
- Breathe deeply through the mouth.
- Get some fresh air.

CONTACT YOUR HEALTHCARE PROFESSIONAL IF:

Your nausea/vomiting is intense and uncontrollable even though you took the prescribed medication.

Fever

Chemotherapy is toxic and thus causes a decrease in white blood cells (which protect the body against infection). People undergoing chemotherapy have a greater risk of infection because the body's ability to defend itself has been compromised.

Watch out for these temperature readings:

- 38 °C: Wait 1 hour, then take your temperature again. If still 38°C, GO TO THE EMERGENCY ROOM.
- 38.3°C or higher: GO TO THE EMERGENCY ROOM RIGHT AWAY.

For patients undergoing chemotherapy, fever is the first sign of infection and constitutes an <u>emergency</u>. If you have a fever, it is very important to avoid taking fever-reducing medication like acetaminophen or ibuprofen, because you may mask an infection.

PREVENTING INFECTION

- Wash your hands regularly (before and after preparing meals, after going to the toilet, after visiting a public area, etc.). Always have a bottle of hand sanitizer with you.
- Avoid communal baths, especially 7 to 10 days after your treatment.
- Throughout your entire treatment, avoid visiting friends and family members who are sick. Reschedule for another time.
- Avoid raw food like tartare, cheese made with unpasteurized milk, and raw eggs.
- When preparing meals, clean the work surface frequently, refrigerate food as quickly as possible, and thaw food in the refrigerator.
- Avoid hot tubs and public spas.

Hair loss

NOT ALL chemotherapy treatments cause hair loss. Some do lighten hair, however, and others cause head and body hair, eyebrows, and eyelashes to fall out.

Duration	 Starts two or three weeks after treatment begins Grows back four to six weeks after treatment ends
Avoid	Hair bleachScented hygiene productsFlat ironsWearing your hair long (knots)
For total hair loss	Protect your scalp (hat or scarf)Wigs are an option

Irritation of the mouth or throat (oral discharge)

The cells lining the mouth, throat, Middle Turbinate and oesophagus may be affected Inferior Turbinate by chemotherapy. Adenoid Soft Palate Tonque Genioglosses Tonsil Muscle Lingual Tonsil Mandible -**Epiglottis** Hyoid Bone Vocal Cords Thyroid Cartilage Trachea -Esophagus

SYMPTOMS

- Swelling in the mouth or throat (redness, inflammation, skin feeling very thin)
- Dry/pasty mouth and tongue, cracked tongue
- · Local or generalized pain in the mouth and throat
- Ulcers (small white spots on cheeks or gums)
- Bleeding gums
- · White spots on tongue, cheeks, or back of throat

RISK FACTORS

- Wounds in the mouth
- Improperly adjusted prostheses
- · Poor oral hygiene
- Oral disease (gingivitis, cavities)
- Smoking
- Alcohol consumption (irritates the mucous membrane)
- Radiotherapy in the head or neck (in addition to chemotherapy)

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- Schedule an appointment with your dentist before your treatment. That way you won't need work done during your treatment, which will help avoid certain complications.
- Use a very soft bristled toothbrush after every meal.
- Gargle with a salt or baking soda mouthwash or an ALCOHOL-FREE commercial mouthwash after brushing your teeth.
- Have your dental prosthesis adjusted.
- Avoid food that is hard, very hot, spicy, or acidic.

TREATMENT

- Take pain medication as needed, but monitor your temperature first (see the section on fever).
- Talk to your healthcare professional to know which treatment is appropriate.
- Eat soft or liquid food that is non-irritating and at room temperature.

CONTACT YOUR HEALTHCARE PROFESSIONAL:

If you have difficulty eating, feel significant pain, or show intense redness, multiple ulcers, or white spots.

Constipation or diarrhea

Stomach troubles are common during chemotherapy. Certain types of chemotherapy have a higher risk of causing side effects.

TREATMENT

CONSTIPATION

- Drink plenty of fluids to soften stools.
- Eat high fibre foods like prunes/prune juice, raw vegetables, rhubarb, and legumes.
- Medication like stool softeners or laxatives may be required. Talk to your healthcare professional to find out what treatment is in order.

CONTACT YOUR HEALTHCARE PROFESSIONAL:

- After more than 4 days without a stool, accompanied by abdominal pain.
- · After more than 7 days without a stool.
- If you have major abdominal pain, nausea in addition to constipation, or no stool but a viscous liquid instead.



TREATMENT

DIARRHEA

- There are no preventive measures for diarrhea.
- Drink plenty of fluids and/or rehydration solutions to avoid dehydration.
- Avoid foods that cause diarrhea such as prunes/prune juice, raw fruits and legumes, rhubarb, caffeine, and alcohol.
- Eat low fibre food like white bread, pasta, and rice and meat or poultry. Bananas and potatoes are rich in potassium and can help prevent dehydration.
- Anti-diarrhea medication can be taken, but talk to your healthcare professional first.

CONTACT YOUR HEALTHCARE PROFESSIONAL:

After more than 3 liquid stools in a day.

If you show any of these signs of dehydration:

- Dry, pasty mouth.
- Skin folds (when you pinch the skin, it takes a few seconds to return to normal).
- Sunken eyes, dark rings under eyes.
- Weakness.



Skin problems

Skin problems come in many forms—dryness, redness, swelling, pain, blisters, flaking, etc. Certain treatments can cause specific side effects. Your healthcare professional can help. Don't hesitate to ask questions.

PREVENTION TREATMENT - Moisturize your skin regularly (twice - If there is any itchiness, a day) with an unscented try antihistamines or light moisturizing cream. cortisone creams. Talk to your - Use broad spectrum sunscreen healthcare professional first. protection (SPF ≥30), wear a hat - If there is any pain, you can and full-length clothing, and avoid take pain medication. Talk to exposure to the sun between 12 p.m. your healthcare professional and 4 p.m. Avoid tanning salons. first. - Use gentle, unscented soaps. Synthetics soaps are also a good idea. - Avoid irritating beauty treatments: peeling, facials, pumice stones. - Avoid exposing your hands or feet to very hot water or cleaning products. Wear gloves to do the dishes or housework. Wear comfortable shoes and avoid friction on your feet (soles and top).

CONTACT YOUR HEALTHCARE PROFESSIONAL:

If any flaking, bleeding, pain, or blisters affect your daily activity

2. Side effects of radiotherapy

Radiotherapy irradiates a specific area of the body to burn the tumour. Side effects are often limited to the treated area and nearby organs. The intensity of the side effects depends on a number of factors:

- Dose of radiotherapy administered
- Size of tumour
- Organ treated
- Use of chemotherapy at the same time

Patients treated with radiotherapy (including patients undergoing brachytherapy) do not give off radiation. There is therefore no risk to friends and family.

Radiation burn

Skin burns, dryness, redness, itchiness, or flaking are almost unavoidable with radiotherapy. The effect is comparable to a bad sunburn. The higher the dose administered, the more intense the burn will be. Symptoms appear on average 3 weeks after treatment begins and continue for up to a week after it ends.

PREVENTION	TREATMENT
 Moisturize your skin regularly (twice a day) with an unscented moisturizing cream. Use broad spectrum sunscreen protection (SPF ≥30), wear a hat and full-length clothing, and avoid exposure to the sun between 12 p.m. and 4 p.m. Avoid tanning salons. Use gentle, unscented soaps. Synthetics soaps are also a good idea. Avoid irritating beauty treatments: peeling, facials, pumice stones. 	 Apply a cool saline compress 3 to 4 times a day for 15 to 20 minutes for light symptoms. For more severe reactions, ointment or antiseptic bandages may be required.

Specific side effects are generally related to the area treated. To find out more, talk to your treatment team. Here are a few examples:

Hair loss	Will be limited to the irradiated area.
Head and neck	Radiation-induced oral discharge is similar to chemotherapy-induced oral discharge, and the preventive measures used are the same.
Brain	Headaches: it is important to inform your healthcare professional before taking medication to relieve headaches.
Stomach	Diarrhea, nausea, vomiting: the preventive measures used with chemotherapy also apply here. Management is also the same.

USEFUL TIPS

LIFESTYLE

A cancer diagnosis will likely upset many aspects of your daily life. It is important to keep living as normally as possible and to maintain your usual habits. Here are some useful tips.

SOCIAL LIFE	
Alcohol consumption	Allowed in moderation.May irritate the mouth or stomach.May cause drowsiness.
Sexual relations	 Allowed. Condoms are recommended for up to four days after treatment. Kissing is always allowed.
Going out	Allowed.Avoid crowds and peak hours.Reschedule a visit if a friend or family member is sick.

HOUSEKEEPING	
Toilet	- Flush twice up for the first 48 hours after treatment.
Clothes/ bedding	- Wash separately for the first 48 hours.
Gardening	Wear gloves.Take care to avoid cuts.
Pets	- Do not clean your cat's kitty litter (it contains potentially harmful bacteria).

SPECIFIC SITUATIONS

Medication in pill form

- Keep out of reach of children.
- Handle them yourself.
- Wash your hands after handling drugs.
- If others handle your medication, they must wear gloves.

NATURAL HEALTHCARE PRODUCTS (NHP)

A multitude of natural healthcare products are available on the market, and companies often claim they can cure cancer or alleviate the side effects of treatments. Be careful! There are very few reliable studies available on these products, and to date, none of them has demonstrated any real potential.

Regardless of the product you are taking or want to take, it is important to inform your treatment team. They will research the product to establish if it is appropriate. The simplest solution, however, is to avoid taking such products, or to set them aside while you are undergoing treatment.



COMMON MYTHS¹

1. Deodorants cause breast cancer

Claims to this effect often float around, given the fact that deodorant is applied near the breast. For example, you may have heard that when the aluminum in antiperspirants is applied to skin, it produces an effect similar to female hormones, which promotes the development of cancer. So far, there is no conclusive evidence linking the use of these products to a higher risk of breast cancer.

2. Cell phones cause brain cancer

Cell phones emit radiofrequency waves. For these waves to cause cancer, they would have to damage your DNA. Radiofrequencies do not damage DNA. The vast majority of studies into this claim have not established any clear link between cell phone use and cancer.

3. Artificial additives cause cancer

A smattering of studies on animals planted seeds of fear regarding the use of additives (saccharine, sucralose, aspartame, cyclamate). However, subsequent studies have **repeatedly failed to establish a clear link** between cancer and the use of additives. They are therefore considered safe.

4. Exposure to electromagnetic fields can cause cancer

Electromagnetic fields are the energy around electrical appliances. Exposure to electromagnetic fields at work (e.g., lineworkers) or from various appliances at home (e.g., microwave ovens, washers, dryers) has never been linked to an increased risk of any type of cancer.

¹ http://www.cancer.gov/cancertopics/myths

USEFUL RESOURCES

A variety of resources are available to help you find out information about your illness. But be careful. Not all websites provide reliable and accurate information. Here are some useful links to help you get started on your search for information you can trust.

Canadian Cancer Society: www.cancer.ca
Institut National du Cancer: www.e-cancer.fr

Local resources:

- Your treatment team
- Your local pharmacist
- Your CLSC
- Assistance provided by the Canadian Cancer Society (hotline, volunteers, support services)

References

OnCible Resource Guide 2012
CSL group education
Canadian Cancer Society
American Cancer society
Passeport sante.ca
British Columbia Cancer Agency (Bccancer.bc.ca)

Groupe d'étude en oncologie du Québec (Geoq.info)

Comité de l'évolution des pratiques en oncologie: Prevention and treatment of nausea and vomiting caused by chemotherapy or radiotherapy in adults, 2012

Oncology Pharmacy Preparatory Review Course 2012 (Board of Clinical Oncology Pharmacy)

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Only pharmacists are responsible for pharmacy practice. They provide related services only on behalf of a pharmacist/owner and use various tools such as the PSST! (Plan to Stay in Shape Today) program tools.