

# **Chemotherapy**

## **Side Effects**

Reference:

NCI - The website of the National Cancer Institute (<http://www.cancer.gov>)

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## **Chemotherapy side effects**

Chemotherapy affects people in different ways. How you feel depends on how healthy you are before treatment, your type of cancer, how advanced it is, the kind of chemotherapy you are getting, and the dose. Chemotherapy is designed to kill fast-growing cancer cells. But it can also affect healthy cells that grow quickly. Chemotherapy causes side effects when it harms these healthy cells. Most side effects go away after chemotherapy is over. But sometimes it can take months or even years for them to go away. Sometimes, chemotherapy causes long-term side effects that do not go away.

Some people do not feel well right after chemotherapy. The common side effects from chemotherapy are fatigue, nausea, vomiting, decreased blood cell counts, hair loss, mouth sores, and pain. There are many ways you can help manage chemotherapy side effects.

Below is a list of side effects that chemotherapy may cause. Not everyone gets every side effect. Which ones you have will depend on the type and dose of your chemotherapy and whether you have other health problems, such as diabetes or heart disease.

Anaemia

Appetite changes

Bleeding

Constipation

Diarrhoea

Fatigue

Hair loss

Infection

Infertility

Mouth and throat changes

Nausea and vomiting

Nervous system changes

Pain

Sexual changes

Skin and nail changes

Urinary, kidney, and bladder changes

Other Side Effects

- Flu-like symptoms

- Fluid retention

- Eye changes

## Anaemia

### What it is and why it occurs

Red blood cells carry oxygen throughout your body. Anaemia is when you have too few red blood cells to carry the oxygen your body needs. Your heart works harder when your body does not get enough oxygen. This can make it feel like your heart is pounding or beating very fast. Anaemia can also make you feel short of breath, weak, dizzy, faint, or very tired.

Some types of chemotherapy cause anaemia because they make it harder for bone marrow to produce new red blood cells.

### Ways to manage

- **Get plenty of rest.** Try to sleep at least 8 hours each night. You might also want to take 1 to 2 short naps (1 hour or less) during the day.
- **Limit your activities.** This means doing only the activities that is most important to you. For example, you might go to work but not clean the house. Or you might order take-out food instead of cooking dinner.
- **Accept help.** When your family or friends offer to help, let them. They can help care for your children, pick up groceries, run errands, drive you to doctor's visits, or do other chores you feel too tired to do.
- **Eat a well-balanced diet.** Choose a diet that contains all the calories and protein your body needs. Calories will help keep your weight up, and extra protein can help repair tissues that have been harmed by cancer treatment. Talk to your doctor, nurse, or dietician about the diet that is right for you.
- **Stand up slowly.** You may feel dizzy if you stand up too fast.

**Your doctor or nurse will check your blood cell count throughout your chemotherapy.** You may need a blood transfusion if your red blood cell count falls too low. Your doctor may also prescribe a medicine to boost (speed up) the growth of red blood cells or suggest that you take iron or other vitamins.

### Call your doctor or nurse if:

- Your level of fatigue changes or you are not able to do your usual activities
- You feel dizzy or like you are going to faint
- You feel short of breath
- It feels like your heart is pounding or beating very fast

## **Appetite Changes**

### **What they are and why they occur**

Chemotherapy can cause appetite changes. You may lose your appetite because of nausea (feeling like you are going to throw up), mouth and throat problems that make it painful to eat, or drugs that cause you to lose your taste for food. They can also come from feeling depressed or tired. Appetite loss may last for a day, a few weeks, or even months.

It is important to eat well, even when you have no appetite. This means eating and drinking foods that have plenty of protein, vitamins, and calories. Eating well helps your body fight infection and repair tissues that are damaged by chemotherapy. Not eating well can lead to weight loss, weakness, and fatigue.

Some cancer treatments cause weight gain or an increase in your appetite. Be sure to ask your doctor, nurse, or dietician what types of appetite changes you might expect and how to manage them.

### **Ways to manage**

- **Eat 5 to 6 small meals or snacks each day instead of 3 big meals.** Choose foods and drinks that are high in calories and protein.
- **Set a daily schedule for eating your meals and snacks.** Eat when it is time to eat, rather than when you feel hungry. You may not feel hungry while you are on chemotherapy, but you still need to eat.
- **Drink milkshakes, smoothies, juice, or soup if you do not feel like eating solid foods.** Liquids like these can help provide the protein, vitamins, and calories your body needs.
- **Use plastic forks and spoons.** Some types of chemo give you a metal taste in your mouth. Eating with plastic can help decrease the metal taste. Cooking in glass pots and pans can also help.
- **Increase your appetite by doing something active.** For instance, you might have more of an appetite if you take a short walk before lunch. Also, be careful not to decrease your appetite by drinking too much liquid before or during meals.
- **Change your routine.** This may mean eating in a different place, such as the dining room rather than the kitchen. It can also mean eating with other people instead of eating alone. If you eat alone, you may want to listen to the radio or watch TV. You may also want to vary your diet by trying new foods and recipes.
- **Talk with your doctor, nurse, or dietician.** He or she may want you to take extra vitamins or nutrition supplements (such as high protein drinks). If you cannot eat for a long time and are losing weight, you may need to take drugs that increase your appetite or receive nutrition through an IV or feeding tube.

## **Bleeding**

### **What it is and why it occurs**

Platelets are cells that make your blood clot when you bleed. Chemotherapy can lower the number of platelets because it affects your bone marrow's ability to make them. A low platelet count is called thrombocytopenia. This condition may cause bruises (even when you have not been hit or have not bumped into anything), bleeding from your nose or in your mouth, or a rash of tiny, red dots.

### **Ways to manage**

#### **Do:**

- Brush your teeth with a very soft toothbrush
- Soften the bristles of your toothbrush by running hot water over them before you brush
- Blow your nose gently
- Be careful when using scissors, knives, or other sharp objects
- Use an electric shaver instead of a razor
- Apply gentle but firm pressure to any cuts you get until the bleeding stops
- Wear shoes all the time, even inside the house or hospital

#### **Do not:**

- Use dental floss or toothpicks
- Play sports or do other activities during which you could get hurt
- Use tampons, enemas, suppositories, or rectal thermometers
- Wear clothes with tight collars, wrists, or waistbands

#### **Check with your doctor or nurse before:**

- Drinking beer, wine, or other types of alcohol
- Having sex
- Taking vitamins, herbs, minerals, dietary supplements, aspirin, or other over-the-counter medicines. Some of these products can change how chemotherapy works.

#### **Your doctor or nurse will check your platelet count often.**

You may need medication, a platelet transfusion, or a delay in your chemotherapy treatment if your platelet count is too low.

#### **Call your doctor or nurse if:**

- Bruises, especially if you did not bump into anything
- Small, red spots on your skin
- Red- or pink-coloured urine
- Black or bloody bowel movements
- Bleeding from your gums or nose
- Heavy bleeding during your menstrual period or a prolonged period
- Vaginal bleeding not caused by your period
- Headaches or changes in your vision
- A warm or hot feeling in your arm or leg

## Constipation

### What it is and why it occurs

Constipation is when bowel movements become less frequent and stools are hard, dry, and difficult to pass. You may have painful bowel movements and feel bloated or nauseous. You may belch, pass a lot of gas, and have stomach cramps or pressure in the rectum.

Drugs such as chemotherapy and pain medicine can cause constipation. It can also happen when people are not active and spend a lot of time sitting or lying down. Constipation can also be due to eating foods that are low in fibre or not drinking enough fluids.

### Ways to manage

- **Keep a record of your bowel movements.** Show this record to your doctor or nurse and talk about what is normal for you. This makes it easier to figure out whether you have constipation.
- **Drink at least 8 cups of water or other fluids each day.** Many people find that drinking warm or hot fluids, such as coffee and tea, help with constipation. Fruit juices, such as prune juice, may also be helpful.
- **Be active every day.** You can be active by walking, riding a bike, or doing yoga. If you cannot walk, ask about exercises that you can do in a chair or bed. Talk with your doctor or nurse about ways you can be more active.
- **Ask your doctor, nurse, or dietician about foods that are high in fibre.** Eating high fibre foods and drinking lots of fluids can help soften your stools. Good sources of fibre include whole-grain breads and cereals, dried beans and peas, raw vegetables, fresh and dried fruit, nuts, seeds, and popcorn.
- **Let your doctor or nurse know if you have not had a bowel movement in 2 days.** Your doctor may suggest a fibre supplement, laxative, stool softener, or enema. Do not use these treatments without first checking with your doctor or nurse.

## Diarrhoea

### What it is and why it occurs

Diarrhoea is frequent bowel movements that may be soft, loose, or watery. Chemotherapy can cause diarrhoea because it harms healthy cells that line your large and small bowel. It may also speed up your bowels. Diarrhoea can also be caused by infections or drugs used to treat constipation.

### Ways to manage

- **Eat 5 or 6 small meals and snacks each day instead of 3 large meals.**
- **Ask your doctor or nurse about foods that are high in salts such as sodium and potassium.** Your body can lose these salts when you have diarrhoea, and it is important to replace them. Foods that are high in sodium or potassium include bananas, oranges, peach and apricot nectar, and boiled or mashed potatoes.
- **Drink 8 to 12 cups of clear liquids each day.** These include water, clear broth, ginger ale, or sports drinks such as Gatorade® or Propel®. Drink slowly, and choose drinks that are at room temperature. Let carbonated drinks lose their fizz before you drink them. Add extra water if drinks make you thirsty or nauseous (feeling like you are going to throw up).
- **Eat low-fiber foods.** Foods that are high in fibre can make diarrhoea worse. Low-fibre foods include bananas, white rice, white toast, and plain or vanilla yogurt.
- **Let your doctor or nurse know if your diarrhoea lasts for more than 24 hours or if you have pain and cramping along with diarrhoea.** Your doctor may prescribe a medicine to control the diarrhoea. You may also need IV fluids to replace the water and nutrients you lost. Do not take any medicine for diarrhoea without first asking your doctor or nurse.
- **Be gentle when you wipe yourself after a bowel movement.** Instead of toilet paper, use a baby wipe or squirt of water from a spray bottle to clean yourself after bowel movements. Let your doctor or nurse know if your rectal area is sore or bleeds or if you have haemorrhoids.
- **Ask your doctor if you should try a clear liquid diet.** This can give your bowels time to rest. Most people stay on this type of diet for 5 days or less.
- **Stay away from:**
  - Drinks that are very hot or very cold
  - Beer, wine, and other types of alcohol
  - Milk or milk products, such as ice cream, milkshakes, sour cream, and cheese
  - Spicy foods, such as hot sauce, salsa, chili, and curry dishes
  - Greasy and fried foods, such as french fries and hamburgers
  - Foods or drinks with caffeine, such as regular coffee, black tea, cola, and chocolate
  - Foods or drinks that cause gas, such as cooked dried beans, cabbage, broccoli, and soy milk and other soy products
  - Foods that is high in fibre, such as cooked dried beans, raw fruits and vegetables, nuts, and whole-wheat breads and cereals.

## Fatigue

### What it is and why it occurs

Fatigue from chemotherapy can range from a mild to extreme feeling of being tired. Many people describe fatigue as feeling weak, weary, worn out, heavy, or slow. Resting does not always help.

Many people say they feel fatigue during chemotherapy and even for weeks or months after treatment is over. Fatigue can be caused by the type of chemotherapy, the effort of making frequent visits to the doctor, or feelings such as stress, anxiety, and depression. If you receive radiation therapy along with chemotherapy, your fatigue may be more severe.

### Fatigue can also be caused by:

- Anaemia
- Pain
- Medications
- Appetite changes
- Trouble sleeping
- Lack of activity
- Trouble breathing
- Infection
- Doing too much at one time
- Other medical problems

Fatigue can happen all at once or little by little. People feel fatigue in different ways. You may feel more or less fatigue than someone else who gets the same type of chemotherapy.

### Ways to manage

- **Relax.** You might want to try meditation, prayer, yoga, guided imagery, visualization, or other ways to relax and decrease stress.
- **Eat and drink well.** Often, this means 5 to 6 small meals and snacks rather than 3 large meals. Keep foods around that are easy to fix, such as canned soups, frozen meals, yogurt, and cottage cheese. Drink plenty of fluids each day--about 8 cups of water or juice.
- **Plan time to rest.** You may feel better when you rest or take a short nap during the day. Many people say that it helps to rest for just 10 to 15 minutes rather than nap for a long time. If you nap, try to sleep for less than 1 hour. Keeping naps short will help you sleep better at night.
- **Be active.** Research shows that exercise can ease fatigue and help you sleep better at night. Try going for a 15-minute walk, doing yoga, or riding an exercise bike. Plan to be active when you have the most energy. Talk with your doctor or nurse about ways you can be active while getting chemotherapy.
- **Try not to do too much.** With fatigue, you may not have enough energy to do all the things you want to do. Choose the activities you want to do and let someone else help with the others. Try quiet activities, such as reading, knitting, or learning a new language on tape.
- **Sleep at least 8 hours each night.** This may be more sleep than you needed before chemotherapy. You are likely to sleep better at night when you are active during the day. You may also find it helpful to relax before going to bed. For instance, you might read a book, work on a jigsaw puzzle, listen to music, or do other quiet hobbies.
- **Plan a work schedule that works for you.** Fatigue may affect the amount of energy you have for your job. You may feel well enough to work your full schedule. Or you may need to work less--maybe just a few hours a day or a few days each week. If your job allows, you may want to talk

with your boss about ways to work from home. Or you may want to go on medical leave (stop working for a while) while getting chemotherapy.

- **Let others help.** Ask family members and friends to help when you feel fatigue. Perhaps they can help with household chores or drive you to and from doctor's visits. They might also help by shopping for food and cooking meals for you to eat now or freeze for later.
- **Learn from others who have cancer.** People who have cancer can help by sharing ways that they manage fatigue. One way to meet others is by joining a support group--either in person or online. Talk with your doctor or nurse to learn more.
- **Keep a diary of how you feel each day.** This will help you plan how to best use your time. Share your diary with your nurse. Let your doctor or nurse know if you notice changes in your energy level, whether you have lots of energy or are very tired.
- **Talk with your doctor or nurse.** Your doctor may prescribe medication that can help decrease fatigue, give you a sense of well-being, and increase your appetite. He or she may also suggest treatment if your fatigue is from anaemia.

## Hair Loss

### What it is and why it occurs

Hair loss (also called alopecia) is when some or all of your hair falls out. This can happen anywhere on your body: your head, face, arms, legs, underarms, or the pubic area between your legs. Many people are upset by the loss of their hair and find it the most difficult part of chemotherapy.

Some types of chemotherapy damage the cells that cause hair growth. Hair loss often starts 2 to 3 weeks after chemotherapy begins. Your scalp may hurt at first. Then you may lose your hair, either a little at a time or in clumps. It takes about 1 week for all your hair to fall out. Almost always, your hair will grow back 2 to 3 months after chemotherapy is over. You may notice that your hair starts growing back even while you are getting chemotherapy.

Your hair will be very fine when it starts growing back. Also, your new hair may not look or feel the same as it did before. For instance, your hair may be thin instead of thick, curly instead of straight, and darker or lighter in colour.

### Ways to manage

#### Before hair loss:

- **Talk with your doctor or nurse.** He or she will know if you are likely to have hair loss.
- **Cut your hair short or shave your head.** You might feel more in control of hair loss if you first cut your hair or shave your head. This often makes hair loss easier to manage. If you shave your head, use an electric shaver instead of a razor.
- **If you plan to buy a wig, do so while you still have hair.** The best time to choose your wig is before chemotherapy starts. This way, you can match the wig to the colour and style of your hair. You might also take it to your hair dresser who can style the wig to look like your own hair. Make sure to choose a wig that feels comfortable and does not hurt your scalp.
- **Ask if your insurance company will pay for a wig.** If it will not, you can deduct the cost of your wig as a medical expense on your income tax. Some groups also have free "wig banks." Your doctor, nurse, or social worker will know if there is a wig bank near you.
- **Be gentle when you wash your hair.** Use a mild shampoo, such as a baby shampoo. Dry your hair by patting (not rubbing) it with a soft towel.
- **Do not use items that can hurt your scalp.** These include:
  - Straightening or curling irons
  - Brush rollers or curlers
  - Electric hair dryers
  - Hair bands and clips
  - Hairsprays
  - Hair dyes
  - Products to perm or relax your hair

#### After hair loss:

- **Protect your scalp.** Your scalp may hurt during and after hair loss. Protect it by wearing a hat, turban, or scarf when you are outside. Try to avoid places that are very hot or very cold. This includes tanning beds and outside in the sun or cold air. And always apply sunscreen or sunblock to protect your scalp.

- **Stay warm.** You may feel colder once you lose your hair. Wear a hat, turban, scarf, or wig to help you stay warm.
- **Sleep on a satin pillow case.** Satin creates less friction than cotton when you sleep on it. Therefore, you may find satin pillow cases more comfortable.
- **Talk about your feelings.** Many people feel angry, depressed, or embarrassed about hair loss. If you are very worried or upset, you might want to talk about these feelings with a doctor, nurse, family member, close friend, or someone who has had hair loss caused by cancer treatment.

## Infection

### What it is and why it occurs

Some types of chemotherapy make it harder for your bone marrow to produce new white blood cells. White blood cells help your body fight infection. Therefore, it is important to avoid infections, since chemotherapy decreases the number of your white blood cells.

There are many types of white blood cells. One type is called neutrophil. When your neutrophil count is low, it is called neutropenia. Your doctor or nurse may do blood tests to find out whether you have neutropenia.

It is important to watch for signs of infection when you have neutropenia. Check for fever at least once a day, or as often as your doctor or nurse tells you to. You may find it best to use a digital thermometer. Call your doctor or nurse if your temperature is 100.5°F or higher.

### Ways to manage

- **Your doctor or nurse will check your white blood cell count throughout your treatment.** If chemotherapy is likely to make your white blood cell count very low, you may get medicine to raise your white blood cell count and lower your risk of infection.
- **Wash your hands often with soap and water.** Be sure to wash your hands before cooking and eating, and after you use the bathroom, blow your nose, cough, sneeze, or touch animals. Carry hand sanitizer for times when you are not near soap and water.
- **Use sanitizing wipes to clean surfaces and items that you touch.** This includes public telephones, ATM machines, doorknobs, and other common items.
- **Be gentle and thorough when you wipe yourself after a bowel movement.** Instead of toilet paper, use a baby wipe or squirt of water from a spray bottle to clean yourself. Let your doctor or nurse know if your rectal area is sore or bleeds or if you have haemorrhoids.
- **Stay away from people who are sick.** This includes people with colds, flu, measles, or chicken pox. You also need to stay away from children who just had a "live virus" vaccine for chicken pox or polio. Call your doctor, nurse, or local health department if you have any questions.
- **Stay away from crowds.** Try not to be around a lot of people. For instance, plan to go shopping or to the movies when the stores and theatres are less crowded.
- **Be careful not to cut or nick yourself.** Do not cut or tear your nail cuticles. Use an electric shaver instead of a razor. And be extra careful when using scissors, needles, or knives.
- **Watch for signs of infection around your catheter.** Signs include drainage, redness, swelling, or soreness. Let your doctor or nurse know about any changes you notice near your catheter.
- **Maintain good mouth care.** Brush your teeth after meals and before you go to bed. Use a very soft toothbrush. You can make the bristles even softer by running hot water over them just before you brush. Use a mouth rinse that does not contain alcohol. Check with your doctor or nurse before going to the dentist.
- **Take good care of your skin.** Do not squeeze or scratch pimples. Use lotion to soften and heal dry, cracked skin. Dry yourself after a bath or shower by gently patting (not rubbing) your skin.
- **Clean cuts right away.** Use warm water, soap, and an antiseptic to clean your cuts. Do this every day until your cut has a scab over it.
- **Be careful around animals.** Do not clean your cat's litter box, pick up dog waste or clean bird cages or fish tanks. Be sure to wash your hands after touching pets and other animals.
- **Do not get a flu shot or other type of vaccine without first asking your doctor or nurse.** Some vaccines contain a live virus, which you should not be exposed to.

- **Keep hot foods hot and cold foods cold.** Do not leave leftovers sitting out. Put them in the refrigerator as soon as you are done eating.
- **Wash raw vegetables and fruits well before eating them.**
- **Do not eat raw or undercooked fish, seafood, meat, chicken, or eggs.** These may have bacteria that can cause infection.
- **Do not have food or drinks that are mouldy, spoiled, or past the freshness date.**
- **Call your doctor right away (even on the weekend or in the middle of the night) if you think you have an infection.** Be sure you know how to reach your doctor after office hours and on weekends. Call if you have a fever of 100.5°F or higher, or when you have chills or sweats. Do not take aspirin, acetaminophen (such as Tylenol®), ibuprofen products, or any other drugs that reduce fever without first talking with your doctor or nurse. Other signs of infection include:
  - Redness
  - Swelling
  - Rash
  - Chills
  - Cough
  - Earache
  - Headache
  - Stiff neck
  - Bloody or cloudy urine
  - Painful or frequent need to urinate
  - Sinus pain or pressure

## Infertility

### What it is and why it occurs

Some types of chemotherapy can cause infertility. For a woman, this means that you may not be able to get pregnant. For a man, this means you may not be able to get a woman pregnant.

In women, chemotherapy may damage the ovaries. This damage can lower the number of healthy eggs in the ovaries. It can also lower the hormones produced by them. The drop in hormones can lead to early menopause. Early menopause and fewer healthy eggs can cause infertility.

In men, chemotherapy may damage sperm cells, which grow and divide quickly. Infertility may occur because chemotherapy can lower the number of sperm, make sperm less able to move, or cause other types of damage.

Whether or not you become infertile depends on the type of chemotherapy you get, your age, and whether you have other health problems. Infertility can last the rest of your life.

### Ways to manage

- **Whether you want to have children.** Before you start chemotherapy, let your doctor or nurse know if you might want to get pregnant in the future. He or she may talk with you about ways to preserve your eggs to use after treatment ends or refer you to a fertility specialist.
- **Birth control.** It is very important that you do not get pregnant while getting chemotherapy. These drugs can hurt the foetus, especially in the first 3 months of pregnancy. If you have not yet gone through menopause, talk with your doctor or nurse about birth control and ways to keep from getting pregnant.
- **Pregnancy.** If you still have menstrual periods, your doctor or nurse may ask you to have a pregnancy test before you start chemotherapy. If you are pregnant, your doctor or nurse will talk with you about other treatment options.

## Mouth and Throat Changes

### What they are and why they occur

Some types of chemotherapy harm fast-growing cells, such as those that line your mouth, throat, and lips. This can affect your teeth, gums, the lining of your mouth, and the glands that make saliva. Most mouth problems go away a few days after chemotherapy is over.

### Mouth and throat problems may include:

- Dry mouth (having little or no saliva)
- Changes in taste and smell (such as when food tastes like metal or chalk, has no taste, or does not taste or smell like it used to)
- Infections of your gums, teeth, or tongue
- Increased sensitivity to hot or cold foods
- Mouth sores
- Trouble eating when your mouth gets very sore

### Ways to manage

- **Visit a dentist at least 2 weeks before starting chemotherapy.** It is important to have your mouth as healthy as possible. This means getting all your dental work done before chemotherapy starts. If you cannot go to the dentist before chemotherapy starts, ask your doctor or nurse when it is safe to go. Be sure to tell your dentist that you have cancer and about your treatment plan.
- **Check your mouth and tongue every day.** This way, you can see or feel problems (such as mouth sores, white spots, or infections) as soon as they start. Inform your doctor or nurse about these problems right away.
- **Keep your mouth moist.** You can keep your mouth moist by sipping water throughout the day, sucking on ice chips or sugar-free hard candy, or chewing sugar-free gum. Ask your doctor or nurse about saliva substitutes if your mouth is always dry.
- **Clean your mouth, teeth, gums, and tongue.**
  - Brush your teeth, gums, and tongue after each meal and at bedtime.
  - Use an extra-soft toothbrush. You can make the bristles even softer by rinsing your toothbrush in hot water before you brush.
  - If brushing is painful, try cleaning your teeth with cotton swabs.
  - Use a fluoride toothpaste or special fluoride gel that your dentist prescribes.
  - Do not use mouthwash that has alcohol. Instead, rinse your mouth 3 to 4 times a day with a solution of 1/4 teaspoon baking soda and 1/8 teaspoon salt in 1 cup of warm water. Follow this with a plain water rinse.
  - Gently floss your teeth every day. If your gums bleed or hurt, avoid those areas but floss your other teeth. Ask your doctor or nurse about flossing if your platelet count is low.
  - If you wear dentures, make sure they fit well and keep them clean. Also, limit the length of time that you wear them.
- **Be careful what you eat when your mouth is sore.**
  - Choose foods that are moist, soft, and easy to chew or swallow. These include cooked cereals, mashed potatoes, and scrambled eggs.
  - Use a blender to puree cooked foods so that they are easier to eat. To help avoid infection, be sure to wash all blender parts before and after using them. If possible, it is best to wash them in a dishwasher.
  - Take small bites of food, chew slowly, and sip liquids while you eat.
  - Soften food with gravy, sauces, broth, yogurt, or other liquids.
  - Eat foods that are cool or at room temperature. You may find that warm and hot foods hurt your mouth or throat.

- Suck on ice chips or popsicles. These can relieve mouth pain.
- Ask your dietician for ideas of foods that are easy to eat. For ideas of soft foods that are easy on a sore mouth.
  
- **Stay away from things that can hurt, scrape, or burn your mouth, such as:**
  - Sharp or crunchy foods, such as crackers and potato or corn chips
  - Spicy foods, such as hot sauce, curry dishes, salsa, and chili
  - Citrus fruits or juices such as orange, lemon, and grapefruit
  - Food and drinks that have a lot of sugar, such as candy or soda
  - Beer, wine, and other types of alcohol
  - Toothpicks or other sharp objects
  - Tobacco products, including cigarettes, pipes, cigars, and chewing tobacco

## Nausea and Vomiting

### What they are and why they occur

Some types of chemotherapy can cause nausea, vomiting, or both. Nausea is when you feel sick to your stomach, like you are going to throw up. Vomiting is when you throw up. You may also have dry heaves, which is when your body tries to vomit even though your stomach is empty.

Nausea and vomiting can occur while you are getting chemotherapy, right after, or many hours or days later. You will most likely feel better on the days you do not get chemotherapy.

New drugs can help prevent nausea and vomiting. These are called antiemetic or anti-nausea drugs. You may need to take these drugs 1 hour before each chemotherapy treatment and for a few days after. How long you take them after chemotherapy will depend on the type of chemotherapy you are getting and how you react to it. If one anti-nausea drug does not work well for you, your doctor can prescribe a different one. You may need to take more than one type of drug to help with nausea. Acupuncture may also help. Talk with your doctor or nurse about treatments to control nausea and vomiting caused by chemotherapy.

### Ways to manage

- **Prevent nausea.** One way to prevent vomiting is to prevent nausea. Try having bland, easy-to-digest foods and drinks that do not upset your stomach. These include plain crackers, toast, and gelatine.
- **Plan when it's best for you to eat and drink.** Some people feel better when they eat a light meal or snack before chemotherapy. Others feel better when they have chemotherapy on an empty stomach (nothing to eat or drink for 2 to 3 hours before treatment). After treatment, wait at least 1 hour before you eat or drink.
- **Eat small meals and snacks.** Instead of 3 large meals each day, you might feel better if you eat 5 or 6 small meals and snacks. Do not drink a lot before or during meals. Also, do not lie down right after you eat.
- **Have foods and drinks that are warm or cool (not hot or cold).** Give hot foods and drinks time to cool down, or make them colder by adding ice. You can warm up cold foods by taking them out of the refrigerator 1 hour before you eat or warming them slightly in a microwave. Drink cola or ginger ale that is warm and has lost its fizz.
- **Stay away from foods and drinks with strong smells.** These include coffee, fish, onions, garlic, and foods that are cooking.
- **Try small bites of popsicles or fruit ices.** You may also find sucking on ice chips helpful.
- **Suck on sugar-free mints or tart candies.** But do not use tart candies if you have mouth or throat sores.
- **Relax before treatment.** You may feel less nausea if you relax before each chemotherapy treatment. Meditate, do deep breathing exercises, or imagine scenes or experiences that make you feel peaceful. You can also do quiet hobbies such as reading, listening to music, or knitting.
- **When you feel like vomiting, breathe deeply and slowly or get fresh air.** You might also distract yourself by chatting with friends or family, listening to music, or watching a movie or TV.
- **Talk with your doctor or nurse.** Your doctor can give you drugs to help prevent nausea during and after chemotherapy. Be sure to take these drugs as ordered and let your doctor or nurse know if they do not work. You might also ask your doctor or nurse about acupuncture, which can help relieve nausea and vomiting caused by cancer treatment.

Tell your doctor or nurse if you vomit for more than 1 day or right after you drink.

## Nervous System Changes

### What they are and why they occur

Chemotherapy can cause damage to your nervous system. Many nervous system problems get better within a year of when you finish chemotherapy, but some may last the rest of your life. Symptoms may include:

- Tingling, burning, weakness, or numbness in your hands or feet
- Feeling colder than normal
- Pain when walking
- Weak, sore, tired, or achy muscles
- Being clumsy and losing your balance
- Trouble picking up objects or buttoning your clothes
- Shaking or trembling
- Hearing loss
- Stomach pain, such as constipation or heartburn
- Fatigue
- Confusion and memory problems
- Dizziness
- Depression

### Ways to manage

- **Let your doctor or nurse know right away if you notice any nervous system changes.** It is important to treat these problems as soon as possible.
- **Be careful when handling knives, scissors, and other sharp or dangerous objects.**
- **Avoid falling.** Walk slowly, hold onto handrails when using the stairs, and put no-slip bath mats in your bathtub or shower. Make sure there are no area rugs or cords to trip over.
- **Always wear sneakers, tennis shoes, or other footwear with rubber soles.**
- **Check the temperature of your bath water with a thermometer.** This will keep you from getting burned by water that is too hot.
- **Be extra careful to avoid burning or cutting yourself while cooking.**
- **Wear gloves when working in the garden, cooking, or washing dishes.**
- **Rest when you need to.**
- **Steady yourself when you walk by using a cane or other device.**
- **Talk to your doctor or nurse if you notice memory problems, feel confused, or are depressed.**
- **Ask your doctor for pain medicine if you need it.**

## Pain

### What it is and why it occurs

Some types of chemotherapy cause painful side effects. These include burning, numbness, and tingling or shooting pains in your hands and feet. Mouth sores, headaches, muscle pains, and stomach pains can also occur.

Pain can be caused by the cancer itself or by chemotherapy. Doctors and nurses have ways to decrease or relieve your pain.

### Ways to manage

- **Talk about your pain with a doctor, nurse, or pharmacist. Be specific and describe:**
  - Where you feel pain. Is it in one part of your body or all over?
  - What the pain feels like. Is it sharp, dull, or throbbing? Does it come and go, or is it steady?
  - How strong the pain is. Describe it on a scale of 0 to 10.
  - How long the pain lasts. Does it last for a few minutes, an hour, or longer?
  - What makes the pain better or worse. For instance, does an ice pack help? Or does the pain get worse if you move a certain way?
  - Which medicines you take for pain. Do they help? How long do they last? How much do you take? How often?
- **Let your family and friends know about your pain.** They need to know about your pain so they can help you. If you are very tired or in a lot of pain, they can call your doctor or nurse for you. Knowing about your pain can also help them understand why you may be acting differently.
- **Practice pain control**
  - Take your pain medicine on a regular schedule (by the clock) even when you are not in pain. This is very important when you have pain most of the time.
  - Do not skip doses of your pain medicine. Pain is harder to control and manage if you wait until you are in a lot of pain before taking medicine.
  - Try deep breathing, yoga, or other ways to relax. This can help reduce muscle tension, anxiety, and pain.
- **Ask to meet with a pain or palliative care specialist.** This can be an oncologist, anaesthesiologist, neurologist, neurosurgeon, nurse, or pharmacist who will talk with you about ways to control your pain.
- **Let your doctor, nurse, or pain specialist know if your pain changes.** Your pain can change over the course of your treatment. When this happens, your pain medications may need to be changed.

## Sexual Changes

### What they are and why they occur

Some types of chemotherapy can cause sexual changes. These changes are different for women and men.

In women, chemotherapy may damage the ovaries, which can cause changes in hormone levels. Hormone changes can lead to problems like vaginal dryness and early menopause.

In men, chemotherapy can cause changes in hormone levels, decreased blood supply to the penis, or damage to the nerves that control the penis, all of which can lead to impotence.

Whether or not you have sexual changes during chemotherapy depends on if you have had these problems before, the type of chemotherapy you are getting, your age, and whether you have any other illnesses. Some problems, such as loss of interest in sex, are likely to improve once chemotherapy is over.

### Problems for **WOMEN** include:

- Symptoms of menopause (for women not yet in menopause). These symptoms include:
  - Hot flashes
  - Vaginal dryness
  - Feeling irritable
  - Irregular or no menstrual periods
  - Bladder or vaginal infections
  - Vaginal discharge or itching
  - Being too tired to have sex or not being interested in having sex
  - Feeling too worried, stressed, or depressed to have sex

### Ways to manage

- **Talk with your doctor or nurse about:**
  - Sex. Ask your doctor or nurse if it is okay for you to have sex during chemotherapy. Most women can have sex, but it is a good idea to ask.
  - Birth control. It is very important that you not get pregnant while having chemotherapy. Chemotherapy may hurt the foetus, especially in the first 3 months of pregnancy. If you have not yet gone through menopause, talk with your doctor or nurse about birth control and ways to keep from getting pregnant.
  - Medications. Talk with your doctor, nurse, or pharmacist about medications that help with sexual problems. These include products to relieve vaginal dryness or a vaginal cream or suppository to reduce the chance of infection.
- **Wear cotton underwear (cotton underpants and pantyhose with cotton linings).**
- **Do not wear tight pants or shorts.**
- **Use a water-based vaginal lubricant when you have sex.**
- **If sex is still painful because of dryness, ask your doctor or nurse about medications to help restore moisture in your vagina.**
- **Cope with hot flashes by:**
  - Dressing in layers, with an extra sweater or jacket that you can take off.
  - Being active. This includes walking, riding a bike, or other types of exercise.
  - Reducing stress. Try yoga, meditation, or other ways to relax.

## Skin and Nail Changes

### What they are and why they occur

Some types of chemotherapy can damage the fast-growing cells in your skin and nails. While these changes may be painful and annoying, most are minor and do not require treatment. Many of them will get better once you have finished chemotherapy. However, major skin changes need to be treated right away because they can cause life-long damage.

### Minor skin changes may include:

- **Itching, dryness, redness, rashes, and peeling**
- **Darker veins.** Your veins may look darker when you get chemotherapy through an IV.
- **Sensitivity to the sun** (when you burn very quickly). This can happen even to people who have very dark skin colour.
- **Nail problems.** This is when your nails become dark, turn yellow, or become brittle and cracked. Sometimes your nails will loosen and fall off, but new nails will grow back in.

### Major skin changes can be caused by:

- **Radiation recall.** Some chemotherapy causes skin in the area where you had radiation therapy to turn red (ranging from very light to bright red). Your skin may blister, peel, or be very painful.
- **Chemotherapy leaking from your IV.** You need to let your doctor or nurse know right away if you have burning or pain when you get IV chemotherapy.
- **Allergic reactions to chemotherapy.** Some skin changes mean that you are allergic to the chemotherapy. Let your doctor or nurse know right away if you have sudden and severe itching, rashes, or hives, along with wheezing or other trouble breathing.

### Ways to manage

- **Itching, dryness, redness, rashes, and peeling**
  - Apply corn starch, as you would dusting powder.
  - Take quick showers or sponge baths instead of long, hot baths.
  - Pat (do not rub) yourself dry after bathing.
  - Wash with a mild, moisturizing soap.
  - Put on cream or lotion while your skin is still damp after washing. Tell your doctor or nurse if this does not help.
  - Do not use perfume, cologne, or aftershave lotion that has alcohol.
  - Take a colloidal oatmeal bath (special powder you add to bath water) when your whole body itches.
- **Acne**
  - Keep your face clean and dry.
  - Ask your doctor or nurse if you can use medicated creams or soaps and which ones to use.
- **Sensitivity to the sun**
  - Avoid direct sunlight. This means not being in the sun from 10 a.m. until 4 p.m. It is the time when the sun is strongest.

- Use sunscreen lotion with an SPF (skin protection factor) of 15 or higher. Or use ointments that block the sun's rays, such as those with zinc oxide.
  - Keep your lips moist with a lip balm that has an SPF of 15 or higher.
  - Wear light-coloured pants, long-sleeve cotton shirts, and hats with wide brims.
  - Do not use tanning beds.
- **Nail problems**
    - Wear gloves when washing dishes, working in the garden, or cleaning the house.
    - Use products to make your nails stronger. (Stop using these products if they hurt your nails or skin.)
    - Let your doctor or nurse know if your cuticles are red and painful.
- **Radiation recall**
    - Protect the area of your skin that received radiation therapy from the sun, and do not use tanning beds.
    - Place a cool, wet cloth where your skin hurts.
    - Wear clothes that are made of cotton or other soft fabrics. This includes your underwear (bras, underpants, and t-shirts).
    - Let your doctor or nurse know if you think you have radiation recall.

## Urinary, Kidney, and Bladder Changes

### What they are and why they occur

Some types of chemotherapy damage cells in the kidneys and bladder. Problems may include:

- Burning or pain when you begin to urinate or after you empty your bladder
- Frequent, more urgent need to urinate
- Not being able to urinate
- Not able to control the flow of urine from the bladder (incontinence)
- Blood in the urine
- Fever
- Chills
- Urine that is orange, red, green, or dark yellow or has a strong medicine odour

Some kidney and bladder problems will go away after you finish chemotherapy. Other problems can last for the rest of your life.

### Ways to manage

- **Your doctor or nurse will take urine and blood samples to check how well your bladder and kidneys are working.**
- **Drink plenty of fluids.** Fluids will help flush the chemotherapy out of your bladder and kidneys.
- **Limit drinks that contain caffeine** (such as black tea, coffee, and some cola products).
- **Talk with your doctor or nurse if you have any of the problems listed above.**

## Other Side Effects

### Flu-like symptoms

Some types of chemotherapy can make you feel like you have the flu. This is more likely to happen if you get chemotherapy along with biological therapy.

#### Flu-like symptoms may include:

- Muscle and joint aches
- Headache
- Fatigue
- Nausea
- Fever
- Chills
- Appetite loss

These symptoms may last from 1 to 3 days. An infection or the cancer itself can also cause them. Let your doctor or nurse know if you have any of these symptoms.

### Fluid retention

Fluid retention is a build-up of fluid caused by chemotherapy, hormone changes caused by treatment, or your cancer. It can cause your face, hands, feet, or stomach to feel swollen and puffy. Sometimes fluid builds up around your lungs and heart, causing coughing, shortness of breath, or an irregular heartbeat. Fluid can also build up in the lower part of your belly, which can cause bloating.

#### You and your doctor or nurse can help manage fluid retention by:

- Weighing yourself at the same time each day, using the same scale. Let your doctor or nurse know if you gain weight quickly.
- Avoiding table salt or salty foods
- Limiting the liquids you drink
- If you retain a lot of fluid, your doctor may prescribe medicine to get rid of the extra fluid.

### Eye changes

- **Trouble wearing contact lenses.** Some types of chemotherapy can bother your eyes and make wearing contact lenses painful. Ask your doctor or nurse if you can wear contact lenses while getting chemotherapy.
- **Blurry vision.** Some types of chemotherapy can clog your tear ducts, which can cause blurry vision.
- **Watery eyes.** Sometimes, chemotherapy can seep out in your tears, which can cause your eyes to water more than usual.
- If your vision gets blurry or your eyes water more than usual, tell your doctor or nurse.

## Foods to Help with Side Effects

Clear Liquids

Liquid Foods

Foods and Drinks That Are High in Calories or Protein

High-Fibre Foods

Low-Fibre Foods

Foods That Are Easy on a Sore Mouth

Foods and Drinks That Are Easy on the Stomach

### Clear Liquids

This list may help if you have:

- Diarrhoea
- Urinary, kidney, or bladder changes

Type	Examples
<b>Soups</b>	Clear, fat-free broth
<b>Drinks</b>	Clear apple juice Clear carbonated beverages Fruit-flavoured drinks Fruit juice, such as cranberry or grape Fruit punch Sports drinks Water Weak tea with no caffeine
<b>Sweets</b>	Fruit ices made without fruit pieces or milk Gelatine Honey Jelly Popsicles

### Liquid Foods

This list may help if you:

- Do not feel like eating solid foods
- Have urinary, kidney, or bladder changes

Type	Examples
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**Soups**

Bouillon  
 Broth  
 Cheese soup  
 Soup that has been strained or put through a blender  
 Soup with pureed potatoes  
 Tomato soup

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**Drinks**

Carbonated beverages  
 Coffee  
 Egnog (pasteurized and alcohol free)  
 Fruit drinks  
 Fruit juices  
 Fruit punch  
 Milk (all types)  
 Milkshakes  
 Smoothies  
 Sports drinks  
 Tea  
 Tomato juice  
 Vegetable juice  
 Water

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**Fats**

Butter  
 Cream  
 Margarine  
 Oil  
 Sour cream

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**Sweets**

Custard (soft or baked)  
 Frozen yogurt  
 Fruit purees that are watered down  
 Gelatine  
 Honey  
 Ice cream with no chunks (such as nuts or cookie pieces)  
 Ice milk  
 Jelly  
 Pudding  
 Syrup  
 Yogurt (plain or vanilla)

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**Replacements and supplements**      Instant breakfast drinks  
Liquid meal replacements

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## **Foods and Drinks That Are High in Calories or Protein**

This list may help if you do not feel like eating.

<b>Type</b>	<b>Examples</b>
<b>Soups</b>	Cream soups Soups with lentils, dried peas, or beans (such as pinto, black, red, or kidney)
<b>Drinks</b>	Instant breakfast drinks Milkshakes Smoothies Whole milk
<b>Main meals and other foods</b>	Beef Butter, margarine, or oil added to your food Cheese Chicken Cooked dried peas and beans (such as pinto, black, red, or kidney) Cottage cheese Cream cheese Croissants Eggs Fish Nuts, seeds, and wheat germ Peanut butter Sour cream
<b>Sweets</b>	Custards (soft or baked) Frozen yogurt Ice cream Muffins Pudding Yogurt (plain or vanilla)

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**Replacements and supplements**

Liquid meal replacements  
Powdered milk added to foods such as pudding, milkshakes, and scrambled eggs

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**High-Fibre Foods**

This list may help if you have Constipation.

Type	Examples
<b>Main meals and other foods</b>	Bran muffins Bran or whole-grain cereals Brown or wild rice Cooked dried peas and beans (such as pinto, black, red, or kidney) Whole-wheat bread Whole-wheat pastas

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**Fruits and vegetables**

Dried fruit, such as apricots, dates, prunes, and raisins  
Fresh fruit, such as apples, blueberries, and grapes  
Raw or cooked vegetables, such as broccoli, corn, green beans, peas, and spinach

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**Snacks**

Granola  
Nuts  
Popcorn  
Seeds, such as sunflower  
Trail mix

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**Low-Fibre Foods**

This list may help if you have Diarrhoea.

Type	Examples
<b>Main meals and other foods</b>	Chicken or turkey (skinless) Cooked refined cereals

Cottage cheese  
Eggs  
Fish  
Noodles  
Potatoes (baked or mashed without the skin)  
White bread  
White rice

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**Fruits and vegetables**

Asparagus  
Bananas  
Canned fruit, such as peaches, pears, and applesauce  
Clear fruit juice  
Vegetable juice

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**Snacks**

Angel food cake  
Gelatine  
Saltine crackers  
Sherbet or sorbet  
Yogurt (plain or vanilla)

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**Foods That Are Easy on a Sore Mouth**

This list may help if your mouth or throat are sore.

Type	Examples
<b>Main meals and other foods</b>	Baby food Cooked refined cereals Cottage cheese Eggs (soft boiled or scrambled) Macaroni and cheese Mashed potatoes Pureed cooked foods Soups

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**Sweets**

Custards  
Fruit (pureed or baby food)  
Gelatine  
Ice cream  
Milkshakes

Puddings  
Smoothies  
Soft fruits (bananas and applesauce)  
Yogurt (plain or vanilla)

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## **Foods and Drinks That Are Easy on the Stomach**

This list may help if you have Nausea and Vomiting.

<b>Type</b>	<b>Examples</b>
<b>Soups</b>	Clear broth, such as chicken, vegetable, or beef
<b>Drinks</b>	Clear carbonated beverages that have lost their fizz Cranberry or grape juice Fruit-flavoured drinks Fruit punch Sports drinks Tea Water
<b>Main meals and other foods</b>	Chicken (broiled or baked without its skin) Cream of rice Instant oatmeal Noodles Potatoes (boiled without skins) Pretzels Saltine crackers White rice White toast
<b>Sweets</b>	Angel food cake Canned fruit, such as applesauce, peaches, and pears Gelatine Popsicles Sherbet or sorbet Yogurt (plain or vanilla)