



## Nausea and Vomiting

### What is nausea and vomiting?

Nausea is an unpleasant feeling in the back of your throat and stomach that may lead to vomiting. Some other ways people describe nausea are *sick to my stomach*, *queasy*, or *upset stomach*. Other symptoms that may happen along with nausea are increased saliva (spit), dizziness, light-headedness, trouble swallowing, skin temperature changes, and a fast heart rate.

People often refer to vomiting as “throwing up.” When you vomit, your stomach muscles contract (squeeze) and push the contents of your stomach out through your mouth. You might or might not feel nauseated.

Sometimes people retch. This is when you try to vomit without bringing anything up from your stomach. Other words used to describe retching are *gagging* or *dry heaves*.

Nausea and vomiting often happen at the same time, but they can be 2 different problems.

### What causes nausea and vomiting in people with cancer?

The information in this document will focus on the nausea and vomiting caused by chemo or radiation therapy. Ask your health care team about what can be done to prevent or control these side effects.

Nausea and/or vomiting in the person with cancer can be caused by many different things, such as:

- Chemotherapy (also called *chemo*)
- Radiation therapy
- The cancer itself, especially if it's in or affecting the brain
- Certain other (non-chemo) medicines
- Bowel slowdown (*paresis*) or blockage (*obstruction*) or even constipation
- Inner ear problems

- An imbalance of minerals and salts (*electrolytes*) in the blood
- Infections
- Anxiety
- The expectation of vomiting due to past vomiting in the same setting (this is called *anticipatory vomiting*)
- Other diseases or illnesses

## How do nausea and vomiting happen?

Doctors think that vomiting is most likely controlled by the part of the brain called the *vomiting center*. Less is known about how nausea occurs. When you are given chemo, 2 things happen:

- A certain area of the brain is triggered
- Certain areas of the esophagus (the tube that connects the mouth to the stomach), stomach, small intestine, and large intestine are triggered

These triggers activate a reflex pathway that leads to nausea and vomiting. Drugs can be used to block different parts of this pathway to control and prevent nausea and vomiting.

## Are nausea and vomiting common in people with cancer?

About 7 or 8 out of every 10 people treated for cancer have bouts of nausea and vomiting. But many medicines control and even prevent nausea and vomiting.

Drugs used to control these side effects are called *anti-nausea/vomiting drugs*. You may also hear them called *anti-emetics*. Every person with cancer who is getting treatments that cause nausea or vomiting can, and should, get medicines to keep this from happening. You don't have to suffer.

## What health problems can nausea and vomiting cause?

Nausea and vomiting are 2 of the most dreaded, unpleasant side effects of cancer treatment, but they only rarely become life-threatening.

Repeated vomiting can lead to *dehydration*, which is a lack of fluids and minerals your body needs. Dehydration can make you not want to eat or drink anything, and if it continues, it can become a serious problem very quickly. Be sure to let your cancer team know right away if any of these happen:

- You can't keep fluids down
- You can't take the medicines you need
- You're vomiting for 24 hours or longer

Vomiting can also cause tiredness (fatigue), trouble concentrating, slow wound healing, weight loss, and loss of appetite. It can interfere with your ability to take care of yourself and may lead to changes in your treatment plan.

## What do I need to know about nausea and vomiting?

Ask your doctor or a member of your health care team these questions:

- Is my cancer treatment likely to cause nausea and vomiting?
- Can my nausea and vomiting be prevented or controlled?
- How will you decide which anti-nausea/vomiting treatments I should use?
- Do the anti-nausea/vomiting treatments you want me to use have side effects?
- When and how often should I take each medicine?
- What will we do if the treatment doesn't control my nausea and vomiting?

Ask your doctor when you should call. For example, many doctors want you to call them if you are vomiting or if you can't keep down fluids or medicines. Some doctors may ask that you weigh yourself each day to quickly spot rapid weight loss from dehydration. Find out if there are other situations where you may need your doctor's help right away. And be sure you know how to reach your cancer team on holidays, weekends, or at night.

## Chemotherapy-related nausea and vomiting

How likely you are to have nausea and vomiting while getting chemotherapy (chemo) depends on many different things. Some of these are:

- The types of chemo drugs used
- The dose of the drugs (high doses of chemo are more likely to cause nausea and vomiting)
- When and how often the drug is given; for example, if doses of a chemo drug that causes nausea and vomiting are given close together, there's less time for the person to recover from the effects of the last dose before the next treatment is given
- How the drugs are given; for instance, chemo given into a vein (intravenous, or by IV) may cause nausea and vomiting much faster than a drug given by mouth, because the drug given by IV is absorbed faster
- Individual differences – not every person will have the same response to a dose or type of chemo

Some personal risk factors that may make you more likely to have nausea and vomiting include:

- Being female
- Being younger than 50
- Having had morning sickness during pregnancy
- Being very anxious or nervous
- Having ever had motion sickness
- Being prone to vomiting when you are sick
- Having been a non-drinker or light drinker (of alcohol)
- Having had chemo in the past

There's no way to know for sure if you will have nausea and vomiting, but your doctor will consider these things when choosing anti-nausea/vomiting medicines to use with your cancer treatment.

## Types of chemo-related nausea and vomiting

There are different types of nausea and vomiting. Nausea and vomiting brought on by chemotherapy (chemo) can be:

- Acute
- Delayed
- Anticipatory
- Breakthrough
- Refractory

**Acute nausea and vomiting** usually happens a few minutes to hours after the chemo is given. It goes away within the first 24 hours. The worst of this acute vomiting most often happens about 5 or 6 hours after chemo.

**Delayed nausea and vomiting** starts more than 24 hours after chemo. It's more likely with certain types of chemo, such as cisplatin, carboplatin, cyclophosphamide, and/or doxorubicin. For example, cisplatin-related vomiting is usually worst from 48 to 72 hours after chemo and can last 6 to 7 days.

**Anticipatory nausea and vomiting** is a learned or conditioned response. It appears to be the result of previous experiences with chemo that led to nausea and vomiting, in which the brain pairs the sights, sounds, and smells of the treatment area with vomiting. Anticipatory nausea and/or vomiting starts as a person prepares for the next treatment, before the chemo is actually given. The brain expects that nausea and vomiting will happen like it did before. About 1 in 3 people will get anticipatory nausea, but only about 1 in 10 will have vomiting before the chemo.

**Breakthrough nausea and vomiting** happens even though treatment has been given to prevent it. When this happens, you need more or different medicines to prevent further nausea and vomiting.

**Refractory vomiting** is when you are getting medicines to prevent or control nausea and vomiting, but the drugs are not working. Your nausea and vomiting have become refractory (no longer respond) to the medicines you are getting to prevent it. This means you need more or different medicines to stop the nausea and/or vomiting. Refractory vomiting happens after a few or even several chemo treatments.

## The risk of vomiting, by specific chemo drug

For information about a specific drug, visit the *Guide to Cancer Drugs* on our Web site. Some chemo drugs are more likely to cause nausea and vomiting than others. When the drugs are studied, though, vomiting is easier to measure than nausea. Doctors describe the chance of chemo causing vomiting when anti-nausea/vomiting treatment is **not given** by using these 4 risk groups:

- **Minimal vomiting risk:** these chemo drugs cause vomiting in less than 10% of people who do not get anti-nausea and vomiting treatment
- **Low vomiting risk:** these chemo drugs cause vomiting in 10% to 30% of people who do not get anti-nausea and vomiting treatment
- **Moderate vomiting risk:** these chemo drugs cause vomiting in 30% to 90% of people who do not get anti-nausea and vomiting treatment. Medicines to prevent nausea and vomiting should be taken for at least 2 days after the last dose of one of these drugs.
- **High vomiting risk:** these chemo drugs cause vomiting in more than 90% of people who do not get anti-nausea and vomiting treatment. Nausea and vomiting prevention treatment should be taken for at least 3 days after the last dose of one of these drugs.

**Please remember that these are the risks for people who do not get effective nausea and vomiting treatment.** These are not the risks that you should expect with your treatment. And many of these drugs have a higher risk of nausea compared to vomiting. For example, 40% of the people who take drug X may feel nausea, but only 20% vomit. So drug X would be on the low risk of vomiting list, even though the risk of nausea is higher.

These risk groups can give you an idea of whether you will need prevention treatment with your chemo, what kind of treatment you may need, and how long you may need it. They can help guide discussions between you and your doctor and nurse.

As noted above, chemo drugs are often grouped by how likely they are to cause vomiting when they are given alone, without anti-nausea/vomiting treatment. Here the drugs are grouped into 2 lists. The first list groups the chemo drugs that are given into a vein, or IV. The second list groups the drugs that are taken by mouth (oral chemo). Both lists are arranged from lowest to highest risk of nausea and vomiting.

## IV chemo drugs

### Minimal risk (less than 10%) of vomiting:

- Alemtuzumab (Campath<sup>®</sup>)
- Asparaginase (Elspar<sup>®</sup>)
- Bevacizumab (Avastin<sup>®</sup>)
- Bleomycin (Blenoxane<sup>®</sup>)
- Cetuximab (Erbix<sup>®</sup>)
- Cladribine (Leustatin<sup>®</sup>)
- Cytarabine (ara-c, Cytosar<sup>®</sup>) (very low doses)
- Decitabine (Dacogen<sup>®</sup>)
- Denileukin diftitox (Ontak<sup>®</sup>)
- Dexrazoxane (Zinecard<sup>®</sup>)
- Fludarabine (Fludara<sup>®</sup>)
- Gemtuzumab (Mylotarg<sup>®</sup>)
- Interferon alfa (low dose)
- Ipilimumab (Yervoy<sup>®</sup>)
- Methotrexate (low-dose)
- Nelarabine (Arranon<sup>®</sup>)
- Ofatumumab (Arzerra<sup>®</sup>)
- Panitumumab (Vectibix<sup>®</sup>)
- Pegaspargase (Oncaspar<sup>®</sup>)
- Peginterferon (Pegasys<sup>®</sup>)
- Pertuzumab (Perjeta<sup>®</sup>)
- Rituximab (Rituxan<sup>®</sup>)
- Temsirolimus (Torisel<sup>®</sup>)
- Trastuzumab (Herceptin<sup>®</sup>)
- Valrubicin (Valstar<sup>®</sup>)
- Vinblastine (Velban<sup>®</sup>)
- Vincristine (Oncovin<sup>®</sup>)
- Vincristine, liposomal (Marqibo<sup>®</sup>)
- Vinorelbine (Navelbine<sup>®</sup>)

### Low risk (10% to 30%) of vomiting:

- Aldesleukin (low-dose)
- Amifostine (Ethyol<sup>®</sup>) (lower doses)
- Bortezomib (Velcade<sup>®</sup>)
- Brentuximab vedotin (Adcetris<sup>®</sup>)

- Cabazitaxel (Jevtana<sup>®</sup>)
- Carfilzomib (Kyprolis<sup>®</sup>)
- Cytarabine (Cytosar<sup>®</sup>, ara-c) (low-dose)
- Docetaxel (Taxotere<sup>®</sup>)
- Doxorubicin, liposomal (Doxil<sup>®</sup>)
- Eribulin (Halaven<sup>®</sup>)
- Etoposide (Vepesid<sup>®</sup>, VP-16)
- Floxuridine (FUDR<sup>®</sup>)
- 5-Fluorouracil (5-FU<sup>®</sup>)
- Gemcitabine (Gemzar<sup>®</sup>)
- Interferon alfa (IntronA<sup>®</sup>, Roferon-A<sup>®</sup>) (moderate-dose)
- Ixabepilone (Ixemptra<sup>®</sup>)
- Methotrexate (moderate-dose)
- Mitomycin (Mutamycin<sup>®</sup>)
- Mitoxantrone (Novantrone<sup>®</sup>)
- Paclitaxel (Taxol<sup>®</sup>)
- Paclitaxel-albumin bound (Abraxane<sup>®</sup>)
- Pemetrexed (Alimta<sup>®</sup>)
- Pentostatin (Nipent<sup>®</sup>)
- Pralatrexate (Folotyn<sup>®</sup>)
- Romidepsin (Istodax<sup>®</sup>)
- Thiotepa
- Topotecan (Hycamtin<sup>®</sup>)

**Moderate risk (30% to 90%) of vomiting:**

- Aldesleukin (IL-2, Proleukin<sup>®</sup>) (higher doses)
- Amifostine (Ethyol<sup>®</sup>) (higher doses)
- Arsenic trioxide (Trisenox<sup>®</sup>)
- Azacitidine (Vidaza<sup>®</sup>)
- Bendamustine (Treanda<sup>®</sup>)
- Busulfan (high doses)
- Carboplatin
- Carmustine (BCNU<sup>®</sup>) (lower doses)
- Clofarabine (Clolar<sup>®</sup>)
- Cyclophosphamide (Cytosan<sup>®</sup>) (lower doses)
- Cytarabine (Cytosar<sup>®</sup>, ara-c) (high doses)
- Dactinomycin

- Daunorubicin
- Doxorubicin (Adriamycin<sup>®</sup>)
- Epirubicin (Ellence<sup>®</sup>)
- Idarubicin (Idamycin<sup>®</sup>)
- Ifosfamide (Ifex<sup>®</sup>)
- Interferon alfa (higher doses)
- Irinotecan (Camptosar<sup>®</sup>)
- Melphalan (Alkeran<sup>®</sup>) (higher doses)
- Methotrexate (high doses)
- Oxaliplatin (Eloxatin<sup>®</sup>)
- Temozolomide (Temodar<sup>®</sup>)

**High risk (greater than 90%) of vomiting:**

- AC combination which is doxorubicin (Adriamycin<sup>®</sup>) given with cyclophosphamide (Cytosan<sup>®</sup>)
- Carmustine (BCNU<sup>®</sup>) (high-dose)
- Cisplatin (moderate to high doses)
- Cyclophosphamide (Cytosan<sup>®</sup>) (high-dose)
- Dacarbazine (DTIC<sup>®</sup>)
- Doxorubicin (Adriamycin<sup>®</sup>) (high doses)
- Epirubicin (Ellence<sup>®</sup>) (high doses)
- Ifosfamide (high doses)
- Streptozocin (Zanosar<sup>®</sup>)

## Oral chemo drugs

**Minimal to low risk of vomiting**

- Axitinib (Inlyta<sup>®</sup>)
- Bexarotene (Targretin<sup>®</sup>)
- Bosutinib (Bosulif<sup>®</sup>)
- Busulfan (low doses)
- Capecitabine (Xeloda<sup>®</sup>)
- Chlorambucil (Leukeran<sup>®</sup>)
- Cyclophosphamide (Cytosan<sup>®</sup>) (low doses)
- Dasatinib (Sprycel<sup>®</sup>)
- Erlotinib (Tarceva<sup>®</sup>)
- Everolimus (Afinitor<sup>®</sup>)
- Fludarabine (Fludara<sup>®</sup>)



- Gefitinib (Iressa<sup>®</sup>)
- Hydroxyurea (Hydrea<sup>®</sup>)
- Imatinib (Gleevec<sup>®</sup>)
- Lapatinib (Tykerb<sup>®</sup>)
- Lenalidomide (Revlimid<sup>®</sup>)
- Melphalan (Alkeran<sup>®</sup>) (low doses)
- Mercaptopurine (Purinethol<sup>®</sup>)
- Methotrexate
- Nilotinib (Tasigna<sup>®</sup>)
- Pazopanib (Votrient<sup>®</sup>)
- Regorafenib (Stivarga<sup>®</sup>)
- Ruxolitinib (Jakafi<sup>®</sup>)
- Sorafenib (Nexavar<sup>®</sup>)
- Sunitinib (Sutent<sup>®</sup>)
- Temozolomide (Temodar<sup>®</sup>) (low doses)
- Thalidomide (Thalomid<sup>®</sup>)
- Thioguanine (TG, 6-TG)
- Topotecan
- Tretinoin
- Vandetanib (Caprelsa<sup>®</sup>)
- Vemurafenib (Zelboraf<sup>®</sup>)
- Vorinostat (Zolinza<sup>®</sup>)

**Moderate to high risk of vomiting:**

- Altretamine (Hexalen<sup>®</sup>)
- Busulfan (high doses)
- Crizotinib (Xalkori<sup>®</sup>)
- Cyclophosphamide (Cytosan<sup>®</sup>) (high doses)
- Estramustine (Emcyt<sup>®</sup>)
- Etoposide (Vepesid<sup>®</sup>, VP-16<sup>®</sup>)
- Lomustine (CeeNU<sup>®</sup>) (single day)
- Mitotane (Lysodren<sup>®</sup>)
- Procarbazine (Matulane<sup>®</sup>)
- Temozolomide (Temodar<sup>®</sup>) (high doses)
- Vismodegib (Erivedge<sup>®</sup>)

So, for example, you can see that high doses of IV cisplatin and cyclophosphamide cause nausea and vomiting in more than 90% of people getting these drugs when no anti-emetic

treatment is given. On the other hand, bleomycin or vincristine cause nausea and vomiting in less than 10% of people who get these drugs IV and do not use anti-nausea/vomiting medicines.

This grouping system is meant to help you when you are talking to your doctor and nurse about your treatment plan. Use these lists to learn what you might expect from the chemo drugs you'll be getting.

You might take more than one chemo drug for your cancer treatment. In general, your doctor should offer anti-nausea/vomiting treatment based on the drug that's most likely to cause nausea and vomiting. This means that if at least one drug on your chemo list is in the high-risk group, you should expect to get at least 2 or 3 different drugs to prevent nausea and vomiting, and you can expect to take them for at least 3 days after treatment. (See the section called "How are nausea and vomiting prevented and treated?" for more on this.)

## Radiation therapy-related nausea and vomiting

Whether radiation therapy causes nausea and vomiting depends on:

**The part of the body being treated.** There's a moderate risk when the area of the body being treated includes a large part of the upper abdomen (belly) – mainly the small intestine (or small bowel), the liver, or the brain.

Treatment with total body radiation therapy (which is used in stem cell transplants), is linked to a high risk of nausea and vomiting if treatment is not given to prevent it. These people may also get high doses of chemo to prepare for transplant, which further raises the chance of nausea and vomiting.

**The dose of radiation given.** About half of people with cancer who get standard doses (180 to 200 centiGray) of radiation to the abdomen have nausea and vomiting. These problems can start 1 to 2 hours after treatment and can last for hours.

**How often the treatment is given.** People who get one large dose of radiation have a greater chance of nausea and vomiting than those who get their radiation treatment in smaller doses.

**If chemotherapy is given along with the radiation.** When radiation is given along with chemotherapy (chemo), the anti-nausea/vomiting treatment used is based on the nausea/vomiting risk of the chemo drugs given.

# How are nausea and vomiting prevented and treated?

Prevention of nausea and vomiting is the goal of treatment. Today, many medicines can be used to control nausea and vomiting, and there are many treatment options.

## Anti-nausea/vomiting medicine used with chemo treatment

No one drug can prevent or control chemo-related nausea and vomiting 100% of the time. This is because chemo drugs act on the body in different ways and each person responds to chemotherapy and the anti-nausea/vomiting (anti-emetic) drugs differently. To choose the best treatment plan, the doctor:

- Considers how likely the chemo is to cause nausea and vomiting if no anti-nausea/vomiting treatment is given “See “The risk of vomiting, by specific chemo drug” section for more on this.)
- Selects anti-nausea/vomiting medicines based on how much the chemo drugs are known to affect the vomiting center in the brain
- Looks at nausea and vomiting you’ve had in the past
- Reviews how well any anti-emetic medicines have worked for you before
- Looks at the side effects of the anti-nausea/vomiting medicines
- Uses the lowest effective dose of the anti-nausea/vomiting medicine before chemo or radiation therapy is given
- Uses medicines to try to prevent (not just control) the nausea and vomiting
- Carefully watches how you respond to the anti-emetic treatment
- Makes drug changes as needed to keep you from having nausea and vomiting

The goal is to prevent nausea and vomiting, because it’s easier to prevent it than it is to stop it once it starts. To help the drugs work best against chemo-related nausea and vomiting:

- Preventive treatment should start **before** the chemo is given.
- It should **continue** for as long as the chemo is likely to cause vomiting, which may be up to 7 to 10 days after the last dose.

Anti-nausea/vomiting medicines are usually given on a regular schedule around the clock. This means you take them even if you don’t have any problems. Sometimes you may be asked to take a medicine on an “as needed” schedule. This means you take the medicine at the first sign of nausea to keep it from getting worse.

Because nausea and vomiting can happen for different reasons, different anti-nausea/vomiting medicines may be used together. In many cases, 2 or more medicines are used. Be sure you know how to take each drug. Ask your doctor or nurse how long after the last dose of chemo you should keep taking the medicine, so that you don't stop taking it too soon.

Each time you start a new cycle of chemo, be sure to tell your cancer team what did and didn't work the last time. If needed, this is the time to make changes to get better control of your nausea and vomiting so that it isn't a problem for the next round. It's also a chance for the doctor to be sure that there aren't other factors besides the chemo adding to your nausea and vomiting.

## Anti-nausea/vomiting medicines used for radiation therapy

When radiation treatment is likely to cause nausea and vomiting, your doctor will probably give you medicines to help prevent it each day before you get your radiation treatment. The anti-nausea/vomiting medicines (anti-emetics) may be given by mouth or into a vein, or both. If you have nausea or vomiting, be sure to tell your doctor so that it can be treated.

## Anti-nausea/vomiting medicines

There are many different anti-nausea/vomiting (anti-emetic) medicines. Different types of these drugs work better for some people than for others.

To start, you'll get anti-nausea/vomiting medicines based on which chemotherapy (chemo) drugs you are getting. For example, if you are getting a chemo drug that's likely to cause nausea and vomiting, you should get the anti-emetic that has proven to work best in other people who got that same drug. If these medicines do not prevent your nausea and vomiting, it's important to tell your doctor so you can get different medicines. **You might have to try a few different medicines to find the ones that work best for you.** Some of the most common anti-nausea/vomiting medicines are listed below. They are grouped by drug type.

### Serotonin (5-HT<sub>3</sub>) antagonists

#### Most commonly used drugs in this group:

- Dolasetron (Anzemet<sup>®</sup>)
- Granisetron (Kytrel<sup>®</sup>)
- Ondansetron (Zofran<sup>®</sup>)
- Palonosetron (Aloxi<sup>®</sup>)

These drugs are given before chemo and then often for a few days afterward. Palonosetron is usually given once before starting a 3-day cycle of chemo; its effects last

longer than the other drugs in this group. This also makes palonosetron a good drug to prevent delayed nausea and vomiting.

These drugs are often given along with a steroid.

Some of these drugs are very expensive and you may need pre-approval from your health insurance before they will be covered. Some are available as generic drugs and cost a lot less than the name brands.

**Common side effects:**

- Headache
- Hiccups
- Diarrhea
- Constipation
- Might change the electric activity in the heart (as seen on an EKG)

**Steroids**

**Most commonly used drugs in this group:**

- Dexamethasone (Decadron<sup>®</sup>)
- Methylprednisolone (Solumedrol or Medrol)

Steroids may be part of your chemo plan, in which case you might not need them (or they may be given at a decreased dose) as part of anti-emetic treatment. They are often given the day of chemo, and maybe for a few days afterwards.

**Common side effects:**

- Trouble sleeping
- Increased appetite
- Fluid retention; swelling in the face, feet, and hands
- Weight gain
- Increased blood sugar levels

**Dopamine antagonists**

**Most commonly used drugs in this group:**

- Droperidol (Inapsine<sup>®</sup>)
- Haloperidol (Haldol<sup>®</sup>)

- Metoclopramide (Reglan<sup>®</sup>)
- Prochlorperazine (Compazine<sup>®</sup>)
- Promethazine (Phenergan<sup>®</sup>)

These drugs are often used “as needed” to prevent nausea and vomiting. You take the medicine at the first sign of nausea to keep it from getting worse. These drugs are available in generic forms and tend to be inexpensive.

**Common side effects:**

- Dry mouth
- Feeling calm or sleepy (sedated)
- Constipation
- Diarrhea
- Sleepiness
- Dizziness (often due to low blood pressure)

These drugs can also cause unplanned movements called *extrapyramidal effects*. These include restlessness, tremors, sticking out the tongue, muscle tightness, and involuntary muscle contractions or spasms. Let your doctor or nurse know right away if this happens. These side effects are more common in younger people and can usually be stopped with other medicines such as diphenhydramine (Benadryl<sup>®</sup>). In some cases, it may be necessary to stop the drug and try another one.

## **Anti-anxiety drugs**

**Most commonly used drugs in this group:**

- Lorazepam (Ativan<sup>®</sup>)
- Alprazolam (Xanax<sup>®</sup>)

These drugs can help reduce nausea and vomiting by reducing anxiety and helping the person feel more calm and relaxed.

**Common side effects:**

- Amnesia (trouble remembering events)
- Sleepiness
- Weakness
- Headache

- Dizziness or lightheadedness
- Dry mouth

## **Cannabinoids**

### **Most commonly used drugs in this group:**

- Dronabinol (Marinol<sup>®</sup>)
- Nabilone (Cesamet<sup>®</sup>)

These drugs may be used to treat nausea and vomiting from chemo when the usual anti-emetic drugs do not work. They also may be used to stimulate appetite.

### **Common side effects:**

- Mood changes (anxiety, depression, paranoia, euphoria, apathy, and more)
- Confusion, disorientation
- Drowsiness
- Muddled thinking, trouble concentrating, poor memory
- Dizziness
- Change in ability to perceive surroundings
- Poor coordination, clumsiness
- Dry mouth
- Increased appetite
- Low energy
- Feeling like you are moving when you are not (vertigo)

These drugs contain the active ingredient in marijuana. Younger patients and those who previously used marijuana tend to tolerate the side effects better.

## **NK-1 receptor antagonists**

### **Drugs in this group:**

- Aprepitant (by mouth) or fosaprepitant (into a vein) (Emend<sup>®</sup>)
- Rolapitant (by mouth) (Varubi)

These drugs are especially good for helping to prevent **delayed** nausea and vomiting. They are often given along with a 5-HT<sub>3</sub> antagonist and a steroid. Fosaprepitant, which is

infused into a vein (IV), is given on the first day of each chemotherapy cycle. The other forms are taken as pills for 1 to 3 days, starting on the first day of each chemotherapy cycle.

Side effects from these drugs can include feeling tired, weak, or dizzy; hiccups; loss of appetite; indigestion; belly pain; diarrhea; and low white blood cell counts.

These drugs can interact with many other drugs, so be sure your doctor knows about all the medicines you take — even those from other doctors, birth control pills, vitamins, herbs, supplements and drugs you can get without a prescription.

These drugs tend to be expensive, and you might need approval from your insurance company before they will pay for it.

## **H2 blockers or proton pump inhibitors**

These drugs are antacids — they decrease stomach acid. One of these drugs may be used to reduce indigestion and heartburn, which can feel like and sometimes lead to nausea and vomiting. Some commonly used examples are:

- Omeprazole (Prilosec<sup>®</sup>)
- Lansoprazole (Prevacid<sup>®</sup>)
- Pantoprazole (Protonix<sup>®</sup>)
- Cimetidine (Tagamet<sup>®</sup>)
- Famotidine (Pepcid<sup>®</sup>)
- Ranitidine (Zantac<sup>®</sup>)

Side effects are not common, but be sure you know what to watch for. Some possible side effects are diarrhea, headache, dizziness, tiredness, rash, but, again, these are rare.

Many of these drugs can be bought without a prescription and they are often available in cheaper, generic forms.

## **How are these drugs used together?**

Drugs from various groups are used together to prevent nausea and vomiting. For instance, if you are getting chemo that includes a high-risk drug (See “The risk of vomiting, by specific chemo drug” in the section called “Chemotherapy-related nausea and vomiting”), you might get this type of anti-emetic treatment: a 5-HT3 antagonist, dexamethasone, an NK-1 receptor antagonist, and maybe an H2 blocker and lorazepam.

If you are getting chemo that has a low risk of causing nausea and vomiting you may be treated with a steroid the day(s) you get chemo and then be given a prescription for a dopamine antagonist in a pill form that you take when you need it — usually at the first



sign of nausea. You may also be given an H2 blocker to take every day and lorazepam to take if needed.

Talk to your doctor, nurse, and/or pharmacists about the drugs you're given. Be sure you understand how and when to take each of them. Also know how they work, what you can expect them to do, and what side effects you should watch for.

## **How are anti-nausea/vomiting medicines given?**

Anti-nausea and vomiting treatment is started before chemo is given and continued for as long as nausea and vomiting can be a problem. (See the section called "How are nausea and vomiting prevented and treated?" for more on how the drugs are chosen.)

Be sure to let your doctor know if you are still having problems despite treatment. There's no reason for you to suffer these side effects. There are many drugs that can be used to prevent and treat nausea and vomiting.

If the drugs used first don't work, your doctor can switch to another drug within a group, add a drug from another group, or try other drugs. Another option is to give the drugs a different way (by a different *route*). For instance, you may be able to take them:

- Through an IV, or as a liquid put into a vein
- By mouth as a pill or liquid you swallow
- As a tablet that dissolves under your tongue
- As a suppository
- Through a patch that sticks to your skin

Your doctor will consider these things when deciding which route should be used to give your anti-emetics:

- How bad your nausea and vomiting is
- The easiest way for you to take the medicine
- What you prefer
- Your medical insurance coverage (many of these drugs are very expensive, especially in IV form)

Taking pills by mouth is often the best, easiest, and cheapest way to prevent nausea and vomiting. But if you're already vomiting, or you can't swallow and keep things down, many of these medicines can be given in other ways. Talk with your doctor about other ways you can take the medicine you need if you can't take it as a pill.

How medicine is given does not change how well it works to prevent or control nausea and vomiting. But it often affects how quickly it starts working. Drugs that are given into the vein or under the tongue usually start working faster.

Talk to your doctor if the drugs cost more than you can afford. There may be other cheaper drugs that work as well. There are also programs to help you pay for certain drugs. (Call us for more on this.)

## **Other treatments for nausea and vomiting**

Although anti-nausea/vomiting medicines (anti-emetics) are the main treatment for nausea and vomiting, some non-drug treatments can also be used. These involve using your mind and body with the help of a qualified therapist.

Non-drug treatments may be used alone for mild nausea, and are often helpful for anticipatory nausea and vomiting. These methods can be used along with anti-nausea/vomiting medicines for a person who's taking chemo drugs that are likely to cause nausea and vomiting. If you would like to try one of these methods, ask a member of your health care team to refer you to a therapist trained in these techniques.

All of these methods try to decrease nausea and vomiting by helping to:

- Relax you
- Distract you from what's going on
- Help you feel in control
- Make you feel less helpless

Here are some non-drug treatments that have helped some people. Please contact us if you would like more details on any of these methods. Most of them have few or no side effects. And with the proper training, nearly anyone can use most of these.

### **Self-hypnosis**

Self-hypnosis was the first technique used to make behavior changes to control nausea and vomiting. It creates a state of intense attention, willingness, and readiness to accept an idea. It's been shown to work very well with children and teens.

### **Progressive muscle relaxation**

Progressive muscle relaxation (PMR) teaches a person to relax by progressively tensing and releasing different muscle groups. It's been used to decrease the nausea and vomiting caused by chemo.

Patients who learn PMR often go on to use this method as a way to cope with other stresses, too. It's also used to help with nervousness, pain, anger, headaches, and depression.

## **Biofeedback**

Biofeedback helps people reach a state of relaxation. Using biofeedback, a person learns to control a certain physical response of the body, such as nausea and vomiting. This is done by tuning in to the moment-to-moment body changes that are linked to the physical response. For example, biofeedback can be used to prevent skin temperature changes, such as those that often happen before nausea and vomiting starts. Biofeedback alone has not been found to work as well as for nausea and vomiting as the combination of biofeedback and progressive muscle relaxation.

## **Guided imagery**

Guided imagery lets people mentally remove themselves from the treatment center and imagine that they are in a place that's relaxing for them. The place can be a vacation spot, a room at home, or some other safe or pleasant place. While trying to imagine what they usually feel, hear, see, and taste in the pleasant place, some people can mentally block the nausea and vomiting.

## **Systematic desensitization**

Systematic desensitization helps people learn how to imagine an anxiety-producing situation (such as nausea and vomiting) and reduce the anxiety related to the situation. In most cases, what a person can imagine without anxiety, he or she can then experience in the real world without anxiety.

## **Acupuncture or acupressure**

Acupuncture is a traditional Chinese technique in which very thin needles are put into the skin. There are a number of different acupuncture techniques, including some that use pressure rather than needles (acupressure). Some clinical studies have found it may help treat anticipatory nausea.

## **Music therapy**

Specially trained health professionals use music to help relieve symptoms. Music therapists may use different methods with each person, depending on that person's needs and abilities. There's some evidence that, when used with standard treatment, music therapy can help to reduce nausea and vomiting due to chemo. It can lower heart rate and blood pressure, relieve stress, and give a sense of well-being.

# **Eating right can help you get through cancer treatment**

Nausea and vomiting can affect how much you eat and what you eat. And good nutrition is important for people being treated for cancer. Many factors related to the illness itself, as well as cancer treatments, can make you not feel like eating and may affect your body's ability to take in food and use nutrients.

Nutritional needs vary during cancer treatment. Some people have trouble getting enough protein and calories during treatment; others gain weight. Your health care team can help you come up with nutrition goals and find an approach to eating that meets your needs. Eating healthy foods while going through cancer treatment can help you:

- Feel better
- Keep up your strength and energy level
- Stay at a healthy weight
- Keep up your body's store of nutrients
- Better handle treatment-related side effects
- Lower your risk of infection
- Recover and heal as quickly as possible

Eating well means eating many different kinds of foods that will give you the nutrients you need for healing. We have a lot of information on nutrition during cancer treatment. Visit us online or call us to learn more.

Some patients need to be treated at a center far from their home, which can make it hard for them to eat well. Most treatment centers have some type of kitchen space. Patients can use this area to store and prepare frozen foods, soups, single servings of fruits, puddings, gelatin, ice cream, or cereals. If there's no kitchen, bring food items that do not need refrigeration, such as single serving packs of canned fruit, gelatin, puddings, cheese or peanut butter crackers, granola bars, or cereal. A nurse or social worker might be able to give you ideas about places to stay and eat while you are getting treatment.

## Tips for people getting chemo

Here are a few tips that may help reduce nausea and vomiting if you are getting chemo.

- On the days you get chemo, make sure you have had something to eat. Most people find that a light meal or snack before chemo is best.
- In most cases, chemo is given on an outpatient basis, such as in an infusion center or a doctor's office. Getting chemo can take a few minutes or many hours. Plan ahead and bring a light meal or snacks with you. Many treatment centers have refrigerators and microwaves you can use.
- Feeling tired or lacking energy (fatigue) is very common when getting chemo. There are some things you can do to deal with fatigue, such as set priorities, pace yourself,

ask others to do chores, plan activities when you have the most energy, know your limits, and eat balanced meals. See our information called *Fatigue in People With Cancer* to learn more.

- Don't be too hard on yourself if side effects make it hard to eat. Try eating small, frequent meals or snacks. Choose the foods that appeal to you the most. Your taste can change on an almost day-to-day basis when you are getting cancer treatment.
- Make the most of days when you feel well and your appetite is good. Always try to eat regular meals and snacks but listen to your body. Never force yourself to eat something that you don't want, or if you feel full.
- Ask family and friends for help shopping and cooking. If you don't have help, think about having meals delivered to your home or maybe having lunch at a local community or senior center. Contact community assistance organizations, area churches, or call us at 1-800-227-2345 for more ideas.
- Most side effects last a short-time and go away when treatment is over. If symptoms last, you should tell your health care team. Nutrition-related side effects should be dealt with right away to help you keep up your weight and energy.

## Tips for people getting radiation therapy

The types of side effects you have during radiation therapy depend on the part of your body getting radiation, the size of the area being treated, the total dose of radiation, and the number of treatments. The list below shows different parts of the body that may be treated and the possible side effects that may make it hard to eat.

- **Brain, spinal cord:** nausea, vomiting
- **Tongue, voice box, tonsils, salivary gland, nose, throat (pharynx):** sore mouth, trouble swallowing or pain with swallowing, change in or loss of taste, sore throat, dry mouth, thick saliva
- **Lung, esophagus, breast:** trouble swallowing, heartburn
- **Large or small intestine, prostate, uterus, cervix, rectum, pancreas:** loss of appetite, nausea, vomiting, diarrhea, gas, bloating

Eating well is important both during and after treatment. If side effects develop or if the anti-nausea/vomiting medicines are not working, tell your health care team.

Here are some eating tips you can try if you're getting radiation therapy:

- Try to eat something at least an hour before treatment rather than going to treatment with an empty stomach.
- Bring food or nutrition supplements to eat or drink on the ride to and from treatment if you must travel a long distance for treatment each day.

- Eat small meals every 2 to 3 hours. Ask friends and family members to help prepare meals, do the shopping, and choose the foods and drinks you enjoy most.
- Don't expect to have the same side effects as someone else being treated for cancer in another part of the body. Even people with the exact same treatments have different degrees of side effects.
- Get to know other cancer patients and talk with them about their experiences, or join a support group. Other patients can be a great source of information and support.

## Managing side effects that make it hard for you to eat right

If you're having trouble eating and/or you're on a special diet (such as for diabetes or heart disease), your food restrictions might be relaxed during cancer treatment. But you should speak with your health care team before making any changes. Here are some things you can do to try to eat as well as possible during treatment:

- Try to eat small meals every 2 or 3 hours rather than eating 3 large meals.
- Add extra calories and protein to foods. Liquid or powdered nutrition supplements are handy during this time. Try different brands and flavors to find out which ones taste best and work best for you. Your doctor, nurse, or a dietitian may be able to tell you more about types of products available and may have samples you can try.
- Try eating most of your food during the time of day when you are best able to eat. Many people find that breakfast time is best.
- Let your health care team know if eating is a problem. Ask a dietitian to give you more tips to help with eating.
- Let your health care team know when anti-nausea/vomiting medicines don't work.

There are also things you can do to help manage or reduce your nausea and vomiting. Here are a few suggestions:

- Eat foods and drink beverages that are "easy on the stomach" or made you feel better when you had the flu or morning sickness. These are often things like ginger ale, bland foods, sour candy, and dry crackers or toast.
- Do **not** force yourself to eat when you feel nauseated.
- Limit your fluid intake during meals.
- Eat food cold or at room temperature.
- Have someone else make the meals if you have nausea.
- Keep your mouth clean; if you vomit, clean your mouth after each time.
- Wear loose fitting clothes.

- Get fresh air with a fan or open window.
- Limit sounds, sights, and smells that cause nausea and vomiting.
- Call your doctor or nurse if your nausea or vomiting is not prevented or controlled with the medicines you have.

You can get more information on eating during cancer treatment in *Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families* read it online or call us to have a free copy sent to you.

Nausea and vomiting can be unpleasant side effects of cancer treatment. But they should not be accepted as a part of cancer treatment – they can be controlled and even prevented. Talk to your health care team if you are having nausea and vomiting. Be willing to work with them to find the right anti-nausea/vomiting medicines for you.

## To learn more

### More information from your American Cancer Society

Here is more information you might find helpful. You also can order free copies of our documents from our toll-free number, 1-800-227-2345, or read them on our Web site, [www.cancer.org](http://www.cancer.org).

Caring for the Patient With Cancer at Home: A Guide for Patients and Families (also in Spanish)

Nutrition for the Person With Cancer During Treatment: A Guide for Patients and Families (also in Spanish)

A Guide to Chemotherapy (also in Spanish)

Understanding Radiation Therapy: A Guide for Patients and Families (also in Spanish)

You can also get more information on each drug used to treat cancer, as well as drugs used to treat nausea and vomiting, by calling us or visiting our Web site.

### Books

Your American Cancer Society also has books that you might find helpful. Call us at 1-800-227-2345 or visit our bookstore online at [www.cancer.org/bookstore](http://www.cancer.org/bookstore) to find out about costs or to place an order.

### National organizations and Web sites\*

Along with the American Cancer Society, other sources of information and support include:

**Meals on Wheels America**

Telephone number: 703-548-5558

Web site: [www.mealsonwheelsamerica.org](http://www.mealsonwheelsamerica.org)

A group of programs that provide home-delivered meals. Some programs may provide other services such as transportation, education, information, and case management. The Web site is the best way to find out if there's a program near you. Costs/fees vary depending on your age and where you live.

**National Cancer Institute**

Toll-free number: 1-800-422-6237 (1-800-4-CANCER)

TTY: 1-800-332-8615

Web site: [www.cancer.gov](http://www.cancer.gov)

Offers information on cancer treatments, symptoms, and coping. More on nausea and vomiting can be found at [www.cancer.gov/cancertopics/pdq/supportivecare/nausea/Patient](http://www.cancer.gov/cancertopics/pdq/supportivecare/nausea/Patient)

**CancerCare**

Toll-free number: 1-800-813-4673

Web site: [www.cancercare.org](http://www.cancercare.org)

Provides information and free professional support by phone and online to people with cancer, their loved ones, and caregivers.

*\*Inclusion on this list does not imply endorsement by the American Cancer Society.*

No matter who you are, we can help. Contact us anytime, day or night, for cancer-related information and support. Call us at **1-800-227-2345** or visit [www.cancer.org](http://www.cancer.org).

## References

Manufacturers' Product Information. Accessed directly from companies and also online at [www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm](http://www.accessdata.fda.gov/scripts/cder/drugsatfda/index.cfm) on February 13, 2013.

National Cancer Institute. Nausea and Vomiting PDQ<sup>®</sup> last modified 9/28/12. Accessed at [www.cancer.gov/cancertopics/pdq/supportivecare/nausea/Patient](http://www.cancer.gov/cancertopics/pdq/supportivecare/nausea/Patient) on February 11, 2013.

National Comprehensive Cancer Network. *Antiemesis. NCCN Clinical Practice Guidelines in Oncology – v.4.2009*. Accessed at [www.nccn.org/professionals/physician\\_gls/PDF/antiemesis.pdf](http://www.nccn.org/professionals/physician_gls/PDF/antiemesis.pdf) on November 16, 2010.

National Comprehensive Cancer Network. *Antiemesis. NCCN Clinical Practice Guidelines in Oncology – v.1.2013*. Accessed at [www.nccn.org/professionals/physician\\_gls/pdf/antiemesis.pdf](http://www.nccn.org/professionals/physician_gls/pdf/antiemesis.pdf) on February 11, 2013.

Schwartzberg LS. Chemotherapy-induced nausea and vomiting: clinician and patient perspectives. *J Support Oncol*. 2007;5(2 Suppl 1):5-12.



Wickham R. Evolving treatment paradigms for chemotherapy-induced nausea and vomiting. *Cancer Control*. 2012;19(2 Suppl):3-9.

**Last Medical Review: 2/27/2013**

**Last Revised: 9/3/2015**

**2013 Copyright American Cancer Society**

For additional assistance please contact your American Cancer Society  
1-800-227-2345 or [www.cancer.org](http://www.cancer.org)