

## Mechlorethamine (Mustargen<sup>®</sup>, Nitrogen Mustard)

**Pronounce:** me-klor-ETH-a-meen

**Classification:** Alkylating Agent

### About Mechlorethamine (Mustargen<sup>®</sup>, Nitrogen Mustard)

Mechlorethamine is a member of a class of chemotherapies called alkylating agents. It used to be called nitrogen mustard, and you may still hear it called this. It is a derivative of nitrogen gas and was first used in World War I as a chemical warfare agent. It was found to have an effect on bone marrow and white blood cells, so research began to investigate its use as a treatment for lymphoma.

Mechlorethamine exerts its anti-cancer effect by a process called alkylation. Alkylation damages the DNA of cells, which prevents them from dividing, and causes them to die. Since cancer cells, in general, divide faster and with less error-correcting than healthy cells, cancer cells are more sensitive to this damage. In this way, mechlorethamine slows or stops the growth of cancer cells in your body.

### How to Take Mechlorethamine

Mechlorethamine is given by intravenous (IV, into a vein) injection. The dosage and schedule are determined by the person's size and type of cancer. In addition, mechlorethamine can be delivered directly into body cavities (lining of the lung, abdomen, and heart).

Even when carefully and correctly administered by trained personnel, this drug may cause a feeling of burning and pain. There is a risk that this medication may leak out of the vein at the injection site, resulting in tissue damage that can be severe. If the area of injection becomes red, swollen, or painful at any time during or after the injection, notify your care team immediately. Do not apply anything to the site unless instructed by your care team.

### Possible Side Effects of Mechlorethamine

There are a number of things you can do to manage the side effects of mechlorethamine. Talk to your care team about these recommendations. They can help you decide what will work best for you. These are some of the most common or important side effects:

#### Nausea and/or Vomiting

Talk to your oncology care team so they can prescribe medications to help you manage [nausea and vomiting](#). In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy, or acidic foods (lemons, tomatoes, oranges). Try saltines, or ginger ale to lessen symptoms.

Call your oncology care team if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

#### Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your [WBC count can drop](#), putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4°F/38°C), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

## Tips to preventing infection:

- [Washing hands](#), both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever, or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bathe daily and perform frequent [mouth care](#).
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your oncology care team before scheduling dental appointments or procedures.
- Ask your oncology care team before you, or someone you live with has any vaccinations.

## Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the [red cell count is low](#), you may feel tired or weak. You should let your oncology care team know if you experience any shortness of breath, difficulty breathing, or pain in your chest. If the count gets too low, you may receive a blood transfusion.

## Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the [count is low](#) you are at a higher risk of bleeding. Let your oncology care team know if you have any excess bruising or bleeding, including nose bleeds, bleeding gums, or blood in your urine or stool. If the platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin/Advil (ibuprofen), Aleve (naproxen), Celebrex (celecoxib), etc. as these can all increase the risk of bleeding. Please consult with your healthcare team regarding the use of these agents and all over-the-counter medications/supplements while on therapy.
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

## Fatigue

[Fatigue](#) is very common during cancer treatment and is an overwhelming feeling of exhaustion that is not usually relieved by rest. While on cancer treatment, and for a period after, you may need to adjust your schedule to manage fatigue. Plan times to rest during the day and conserve energy for more important activities. Exercise can help combat fatigue; a simple daily walk with a friend can help. Talk to your healthcare team for helpful tips on dealing with this side effect.

## Loss or Thinning of Scalp and Body Hair (Alopecia)

Your hair may become [thin, brittle, or may fall out](#). This typically begins two to three weeks after treatment starts. This hair loss can be all body hair, including pubic, underarm, legs/arms, eyelashes, and nose hairs. The use of scarves, wigs, hats, and hairpieces may help. Hair generally starts to regrow soon after treatment is completed. Remember your hair helps keep you warm in cold weather, so a hat is particularly important in cold weather or to protect you from the sun.

## Decrease in Appetite

[Nutrition](#) is an important part of your care. Cancer treatment can affect your appetite and, in some cases, the side effects of treatment can make eating difficult. Ask your oncology care team about nutritional counseling

services at your treatment center to help with food choices.

- Try to eat five or six small meals or snacks throughout the day, instead of 3 larger meals.
- If you are not eating enough, nutritional supplements may help.
- You may experience a metallic taste or find that food has no taste at all. You may dislike foods or beverages that you liked before receiving cancer treatment. These symptoms can last for several months or longer after treatment ends.
- Avoid any food that you think smells or tastes bad. If red meat is a problem, eat chicken, turkey, eggs, dairy products, and fish without a strong smell. Sometimes cold food has less of an odor.
- Add extra flavor to meat or fish by marinating it in sweet juices, sweet and sour sauce, or dressings. Use seasonings like basil, oregano, or rosemary to add flavor. Bacon, ham, and onion can add flavor to vegetables.

## Secondary Cancers

A secondary cancer is one that develops as a result of cancer treatment for another cancer. This is quite rare, but you should be aware of the risk. In most cases, a secondary cancer related to chemotherapy is a blood cancer (leukemia, lymphoma). This can occur years after treatment. This is most often associated with repeated treatments or high doses. Your provider will monitor your labs closely. Consider having a complete blood count with differential checked annually by your healthcare provider if you received high-risk therapies.

## Hypersensitivity and Allergic Reaction

In some cases, patients can have hypersensitivity or an allergic reaction to this medication. Signs of a reaction can include shortness of breath or difficulty breathing, chest pain, rash, flushing or itching, or a decrease in blood pressure. If you notice any changes in how you feel during the infusion, let your nurse know immediately.

## Skin Changes

Some patients may develop a rash, very dry skin, or blisters. You may notice a darkening of the veins used for infusion. Use an alcohol-free moisturizer on your skin and lips; avoid moisturizers with perfumes or scents. Your doctor or nurse can recommend a topical medication if itching is bothersome. If your skin does crack or bleed, be sure to keep the area clean to avoid infection. Be sure to notify your healthcare provider of any rash that develops, as this can be a reaction. They can give you more tips on [caring for your skin](#).

## Less common but important side effects can include:

- **Tumor Lysis Syndrome:** If there are a large number of tumor cells in your body prior to treatment, you are at risk for tumor lysis syndrome. This happens when the tumor cells die too quickly and their waste overwhelms the body. You may be given a medication (allopurinol) and IV fluids to help prevent this. If you experience nausea, vomiting, diarrhea or become lethargic (drowsy, sluggish), notify your oncology team right away. TLS can affect your kidney function. Your provider will monitor your kidney function with blood work. Notify your provider if you have little or no urine output.
- **Vertigo:** Vertigo is ringing in the ears or diminished hearing. Report symptoms of dizziness or hearing changes to your healthcare team.

## Sexual & Reproductive Concerns

This medication may affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and [vaginal dryness](#). In addition, the desire for sex may decrease during treatment. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team.

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment even if your

menstrual cycle stops or you believe you are not producing sperm. You should consult with your healthcare team before breastfeeding while receiving this medication.

## Prednisone (Sterapred®, Prednisone Intensol)

**Pronounce:** PRED-ni-sone

**Classification:** Glucocorticoid

### About Prednisone (Sterapred®, Prednisone Intensol)

Prednisone is a corticosteroid/glucocorticoid that is similar to a hormone made naturally in your body. Corticosteroids (sometimes called "steroids") are used to lessen inflammation (swelling and/or redness). Steroids may be used for a few diseases, such as asthma, autoimmune disorders, reactions to medications, and gastrointestinal (GI) disorders (colitis). Prednisone may be given to prevent a reaction to a medication, to prevent or decrease nausea, or it can be used in high doses to treat some types of cancers.

### How to Take Prednisone

Prednisone comes as a tablet to take by mouth. The tablet should be swallowed whole. You should not break or chew the tablet. Prednisone is best taken with food or milk, as it can irritate your stomach. Your provider will probably tell you to take your dose(s) of prednisone at the same time(s) each day. Your dosing schedule depends on what the medication is being used for. If you miss a dose, take it as soon as possible. If it is too close to your next dose, skip the missed dose and go back to your normal schedule.

Do not stop taking this medication without first speaking to your care provider as this could cause side effects such as weakness, fatigue, decreased appetite, weight loss, nausea, vomiting, diarrhea, and abdominal (belly) pain.

This medication can affect the levels of many other medications including warfarin, cyclosporine, oral birth control pills, phenytoin, bupropion, thalidomide, erythromycin, ketoconazole, and ritonavir, among others. Be sure to tell your healthcare provider about all medications and supplements you take.

You, or anyone you live with, should avoid having live or live-attenuated vaccines while receiving this medication. These include herpes zoster (Zostavax) for shingles prevention, oral polio, measles, nasal flu vaccine (FluMist®), rotavirus, and yellow fever vaccines.

### Storage and Handling

Store your medication in the original, labeled container at room temperature and in a dry location (unless otherwise directed by your healthcare provider or pharmacist). Keep containers out of reach of children and pets.

### Where do I get this medication?

Prednisone is available through most pharmacies. Your oncology team will work with your prescription drug plan to identify an in-network pharmacy for the distribution of this medication.

### Insurance Information

This medication may be covered under your prescription drug plan. Patient assistance may be available to qualifying individuals without prescription drug coverage. Your care team can help you find these resources if they are available.

### Possible Side Effects of Prednisone

There are a number of things you can do to manage the side effects of prednisone. Talk to your care team about these recommendations. They can help you decide what will work best for you. These are some of the most common or important side effects:

## Swelling

Patients may notice swelling in their hands and/or feet. Elevating (raising) the feet may help to lessen swelling in the feet and ankles. Avoid restrictive or tight clothing that may make it harder for the fluid to drain from the hands, feet, and ankles.

## Increased Risk of Infection

This medication can lower your ability to fight new and current infections. Contact your provider if you have any signs of infection, such as fever, chills, sore throat or cold, cough or burning with urination.

Tips to preventing infection:

- [Washing hands](#), both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever, or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bathe daily and perform frequent [mouth care](#).
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your doctor or nurse before scheduling dental appointments or procedures.
- Ask your doctor or nurse before you, or someone you live with has any vaccinations.

## Weakening of the Bones (Osteoporosis)

Long-term use can lead to early osteoporosis. Your provider may have you get a [bone density scan \(DEXA scan\)](#) to check your bone health if you are on long-term therapy.

## Eye Problems

Long-term use of this medication can increase the pressure in your eyes. Report any changes in vision, blurry or double vision, and eye pain or redness.

## Increase in Appetite

Prednisone can cause you to be hungrier or thirstier than usual. Drink plenty of fluids and try to make your snacks healthy ones.

## Increase in Energy

Prednisone can cause an increase in energy. You may also have insomnia, or difficulty sleeping. Taking the medication in the morning may help prevent this.

## Irritability or Change in Mood

Some patients report feeling irritable or might notice a change in their mood while taking prednisone. If this becomes difficult to handle or if you feel like you may harm yourself or others, call your healthcare provider right away.

## Nausea and Heartburn

Taking prednisone with food or milk is usually enough to prevent nausea and heartburn. If possible, take the medication when you can be upright (not lying down) for a few hours after the dose. Avoid things that worsen

the symptoms and try antacids (milk of magnesia and calcium tablets, like Tums), saltines, or ginger ale to lessen symptoms.

## Increased Blood Sugar

Prednisone can raise your blood sugar. Diabetics should watch their blood sugar closely and may need higher doses of insulin while taking prednisone. Patients who are not diabetic but have increased blood sugar levels may be told to check their blood sugar and take insulin while on prednisone. Your provider will tell you if this is necessary.

## GI Bleed & Tear

This medication can cause bleeding or a tear in your intestinal wall (GI tract). Signs of these problems may be: unexpected bleeding, blood in the stool or black stools, coughing up blood, vomiting blood, vomit that looks like coffee grounds, fever, severe pain in the abdomen, or new abdominal swelling. If you have any of these, contact your oncology care team right away or go to the emergency room.

## Other Side Effects

Prednisone can cause delayed wound healing, headaches, muscle weakness, and cataracts (after long-term use).

## Reproductive Concerns

Exposure of an unborn child to this medication could cause birth defects in rare cases, so you should not become pregnant or father a child while on this medication. Even if your menstrual cycle stops or you believe you are not producing sperm, you could still be fertile and conceive. You should check with your healthcare team before breastfeeding while receiving this medication.

# Procarbazine (Matulane®)

**Pronounce:** proe-KAR-ba-zeen

**Classification:** Alkylating Agent

## About Procarbazine (Matulane®)

Procarbazine exerts its anti-cancer effect through a process called alkylation. Alkylation damages the DNA of cells, which prevents them from dividing, and causes them to die. Since cancer cells, in general, divide faster and with less error-correcting than healthy cells, cancer cells are more sensitive to this damage.

## How to Take Procarbazine

Procarbazine comes as a capsule, to be taken by mouth. Take the capsule whole, do not break, chew, or open the capsules. The dosage and schedule are determined by the person's size. If you forget to take a dose, take it as soon as you remember. If it is close to your next dose do not double your dose, rather skip the dose and resume your usual dosing schedule.

It is important to make sure you are taking the correct amount of medication every time. Before every dose, check that what you are taking matches what you have been prescribed.

Patients should avoid alcoholic beverages while taking procarbazine. The combination of alcohol and procarbazine can cause unpleasant side effects. Foods high in tyramine (wine, ripe cheeses, and bananas) should also be avoided. Consuming foods high in tyramine while taking procarbazine can raise your blood pressure. Numerous medications including barbituates, antihistamines, narcotics, and phenothiazines can cause central nervous system depression and should be avoided. Make sure your provider is aware of all the medications, vitamins, and supplements you are taking. Patients should avoid smoking while taking procarbazine because there is an increased risk of developing lung cancer.

## Storage and Handling

Store your medication in the original, labeled container at room temperature and in a dry location (unless otherwise directed by your healthcare provider or pharmacist). This medication should not be stored in a pillbox. Keep containers out of reach of children and pets.

If a caregiver prepares your dose for you, they should consider wearing gloves or pour the pills directly from their container into the cap, a small cup, or directly into your hand. They should avoid touching the pills. They should always wash their hands before and after giving you the medication. Pregnant or nursing women should not prepare the dose for you. Ask your oncology team where to return any unused medication for disposal. Do not flush down the toilet or throw it in the trash.

## Where do I get this medication?

Procarbazine is available through select specialty pharmacies. Your oncology team will work with your prescription drug plan to identify an in-network specialty pharmacy for the distribution of this medication and shipment directly to your home.

## Insurance Information

This medication may be covered under your prescription drug plan. Patient assistance may be available to qualifying individuals without prescription drug coverage. Co-pay cards, which reduce the patient co-pay responsibility for eligible commercially (non-government sponsored) insured patients, are also available. Your care team can help you find these resources if they are available.

## Possible Side Effects of Procarbazine

There are a number of things you can do to manage the side effects of procarbazine. Talk to your care team about these recommendations. They can help you decide what will work best for you. These are some of the most common side effects:

### Nausea and/or Vomiting

Talk to your oncology care team so they can prescribe medications to help you manage [nausea and vomiting](#). In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy, or acidic foods (lemons, tomatoes, oranges). Try saltines, or ginger ale to lessen symptoms.

Call your oncology care team if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

### Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your [WBC count can drop](#), putting you at a higher risk of getting an infection. You should let your doctor or nurse know right away if you have a fever (temperature greater than 100.4°F or 38°C), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

### Tips to preventing infection:

- [Washing hands](#), both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever, or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.



- Shower or bathe daily and perform frequent [mouth care](#).
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your oncology care team before scheduling dental appointments or procedures.
- Ask your oncology care team before you, or someone you live with has any vaccinations.

## Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the [red cell count is low](#), you may feel tired or weak. You should let your oncology care team know if you experience any shortness of breath, difficulty breathing, or pain in your chest. If the count gets too low, you may receive a blood transfusion.

## Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the [count is low](#) you are at a higher risk of bleeding. Let your oncology care team know if you have any excess bruising or bleeding, including nose bleeds, bleeding gums, or blood in your urine or stool. If the platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin/Advil (ibuprofen), Aleve (naproxen), Celebrex (celecoxib), etc. as these can all increase the risk of bleeding. Please consult with your healthcare team regarding the use of these agents and all over-the-counter medications/supplements while on therapy.
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

## Mouth Ulcers (Mucositis)

Certain cancer treatments can cause [sores or soreness in your mouth](#) and/or throat. Notify your oncology care team if your mouth, tongue, inside of your cheek, or throat becomes white, ulcerated, or painful. Performing [regular mouth care](#) can help prevent or manage mouth sores. If mouth sores become painful, your doctor or nurse can recommend a pain reliever.

- Brush with a soft-bristle toothbrush or cotton swab twice a day.
- Avoid mouthwashes that contain alcohol. A baking soda and/or salt with warm water mouth rinse (2 level teaspoons of baking soda or 1 level teaspoon of salt in an eight-ounce glass of warm water) is recommended 4 times daily.
- If your mouth becomes dry, eat moist foods, drink plenty of fluids (6-8 glasses), and suck on sugarless hard candy.
- Avoid smoking and chewing tobacco, drinking alcoholic beverages, and citrus juices.

## Less common, but important side effects

- **Secondary Malignancies:** There is a slight risk of developing leukemia or another type of cancer due to treatment with this medication. This is most often associated with repeated treatments or high doses. Patients should avoid smoking if they have received procarbazine. There is an increased risk of developing lung cancer after treatment with this medication and smoking can further increase the risk.
- **Central Neurotoxicity:** this can present as weakness, loss of balance or coordination, unsteadiness, dizziness, or drowsiness. Notify your healthcare provider right away if you experience any of these symptoms.
- **Allergic reaction:** In some cases, patients can have an allergic reaction to this medication. Signs of a reaction can include shortness of breath or difficulty breathing, chest pain, rash, flushing or itching, or a



decrease in blood pressure. Inform your care team immediately if you have symptoms of an allergic reaction.

- **Diarrhea:** Your oncology care team can recommend medications to relieve [diarrhea](#). Also, try eating [low-fiber](#), bland foods, such as white rice and boiled or baked chicken. Avoid raw fruits, vegetables, whole-grain breads, cereals, and seeds. Soluble fiber is found in some foods and absorbs fluid, which can help relieve diarrhea. Foods high in soluble fiber include applesauce, bananas (ripe), canned fruit, orange sections, boiled potatoes, white rice, products made with white flour, oatmeal, cream of rice, cream of wheat, and farina. Drink 8-10 glasses of non-alcoholic, uncaffeinated fluid a day to prevent dehydration.
- **Peripheral Neuropathy (Numbness or Tingling in the Hands and/or Feet):** [Peripheral neuropathy](#) is a toxicity that affects the nerves. It causes numbness or a tingling feeling in the hands and/or feet, often in the pattern of a stocking or glove. This can get progressively worse with additional doses of the medication. In some people, the symptoms slowly resolve after the medication is stopped, but for some, it never goes away completely. You should let the oncology care team know if you experience numbness or tingling in the hands and/or feet, as they may need to adjust the doses of your medication.

## Sexual and Reproductive Changes

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment, even if your menstrual cycle stops or you believe you are not producing sperm. You should consult with your healthcare team before breastfeeding while receiving this medication.

This medication may affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and [vaginal dryness](#). In addition, the desire for sex may decrease during treatment. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team.

## Vincristine (Oncovin<sup>®</sup>, Vincasar PFS<sup>®</sup>, VCR)

**Pronounce:** vin-KRIS-teen

**Classification:** Antimicrotubule Agent

### About Vincristine (Oncovin<sup>®</sup>, Vincasar PFS<sup>®</sup>, VCR)

Vincristine is a member of the vinca alkaloids family of chemotherapy agents. These medications work by interfering with cell division, which leaves the tumor unable to grow and spread. Vincristine was developed from the periwinkle plant.

### How to Take Vincristine

This medication is administered intravenously (IV, into a vein) by a trained professional. Your dose and treatment schedule depend on your size and the type of cancer being treated.

This medication is a vesicant. Even when carefully and correctly administered by trained personnel, this drug may cause a feeling of burning and pain. There is a risk that this medication may leak out of the vein at the injection site, resulting in tissue damage that can be severe. If the area of injection becomes red, swollen, or painful at any time during or after the injection, notify your doctor or nurse immediately. Do not apply anything to the site unless instructed by your doctor or nurse.

The blood levels of this medication can be affected by certain foods and medications, so they should be avoided. These include grapefruit, grapefruit juice, ketoconazole, rifampin, phenytoin, St. John's wort, and

many anti-fungal medications. Be sure to tell your healthcare provider about all medications and supplements you take.

## Possible Side Effects of Vincristine

There are a number of things you can do to manage the side effects of vincristine. Talk to your care team about these recommendations. They can help you decide what will work best for you. These are some of the most common or important side effects:

### Constipation

Vincristine can cause serious constipation, abdominal pain and can even lead to a blockage or stoppage of the bowel (called paralytic ileus) if not treated promptly. There are several things you can do to prevent or relieve constipation. Include fiber in your diet (fruits and vegetables), drink 8-10 glasses of non-alcoholic fluids a day, and keep active. A stool softener once or twice a day may prevent constipation. If you do not have a bowel movement for 2-3 days, you should contact your healthcare team for [suggestions to relieve the constipation](#).

### Neurotoxicity

This is a toxicity that affects the nerves. The most common effect is called peripheral neuropathy, which affects the nerves in the hands and feet, causing causes numbness or tingling, often in the pattern of a stocking or glove. This can get worse with additional doses of the medication and can lead to difficulty with balance or walking. In some people, the symptoms slowly get better after the medication is stopped, but for some, it never goes away completely. Let your healthcare provider know if you have numbness or tingling in the hands and feet, as they may need to adjust the doses of your medication.

The vinca alkaloid class of chemotherapies is known to cause neuropathy, but vincristine can also cause neurologic toxicity that presents as mental depression, headache, malaise, dizziness, and seizures. It can also cause toxicity of the cranial nerves, which affects the vocal cords (changes in voice), eyes (visual changes), or facial nerves (drooping of the face or mouth). Patients can develop severe pain in the jaw soon after the first treatment with vincristine, which is caused by the medication affecting the nerves. If you notice any of these problems, notify your healthcare team right away.

### Low White Blood Cell Count (Leukopenia or Neutropenia)

White blood cells (WBC) are important for fighting infection. While receiving treatment, your [WBC count can drop](#), putting you at a higher risk of getting an infection. You should let your provider know right away if you have a fever (temperature greater than 100.4°F or 38°C), sore throat or cold, shortness of breath, cough, burning with urination, or a sore that doesn't heal.

#### Tips to preventing infection:

- [Washing hands](#), both yours and your visitors, is the best way to prevent the spread of infection.
- Avoid large crowds and people who are sick (i.e.: those who have a cold, fever, or cough or live with someone with these symptoms).
- When working in your yard, wear protective clothing including long pants and gloves.
- Do not handle pet waste.
- Keep all cuts or scratches clean.
- Shower or bathe daily and perform frequent [mouth care](#).
- Do not cut cuticles or ingrown nails. You may wear nail polish, but not fake nails.
- Ask your oncology care team before scheduling dental appointments or procedures.
- Ask your oncology care team before you, or someone you live with has any vaccinations.

### Low Red Blood Cell Count (Anemia)

Your red blood cells are responsible for carrying oxygen to the tissues in your body. When the [red cell count is low](#), you may feel tired or weak. You should let your oncology care team know if you experience any shortness of breath, difficulty breathing, or pain in your chest. If the count gets too low, you may receive a blood transfusion.

## Low Platelet Count (Thrombocytopenia)

Platelets help your blood clot, so when the [count is low](#) you are at a higher risk of bleeding. Let your oncology care team know if you have any excess bruising or bleeding, including nose bleeds, bleeding gums, or blood in your urine or stool. If the platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor (an electric razor is fine).
- Avoid contact sports and activities that can result in injury or bleeding.
- Do not take aspirin (salicylic acid), non-steroidal, anti-inflammatory medications (NSAIDs) such as Motrin/Advil (ibuprofen), Aleve (naproxen), Celebrex (celecoxib), etc. as these can all increase the risk of bleeding. Please consult with your healthcare team regarding the use of these agents and all over-the-counter medications/supplements while on therapy.
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

## Mouth Ulcers (Sores)

Certain cancer treatments can cause [sores or soreness in your mouth](#) and/or throat. Notify your oncology care team if your mouth, tongue, inside of your cheek or throat becomes white, ulcerated, or painful. Performing [regular mouth care](#) can help prevent or manage mouth sores. If mouth sores become painful, your doctor or nurse can recommend a pain reliever.

- Brush with a soft-bristle toothbrush or cotton swab twice a day.
- Avoid mouthwashes that contain alcohol. A baking soda and/or salt with warm water mouth rinse (2 level teaspoons of baking soda or 1 level teaspoon of salt in an eight-ounce glass of warm water) is recommended 4 times daily.
- If your mouth becomes dry, eat moist foods, drink plenty of fluids (6-8 glasses), and suck on sugarless hard candy.
- Avoid smoking and chewing tobacco, drinking alcoholic beverages, and citrus juices.

## Loss or Thinning of Scalp and Body Hair (Alopecia)

Your hair may become [thin, brittle, or may fall out](#). This typically begins two to three weeks after treatment starts. This hair loss can be all body hair, including pubic, underarm, legs/arms, eyelashes, and nose hairs. The use of scarves, wigs, hats, and hairpieces may help. Hair generally starts to regrow soon after treatment is completed. Remember your hair helps keep you warm in cold weather, so a hat is particularly important in cold weather or to protect you from the sun.

## Fatigue

[Fatigue](#) is very common during cancer treatment and is an overwhelming feeling of exhaustion that is not usually relieved by rest. While on cancer treatment, and for a period after, you may need to adjust your schedule to manage fatigue. Plan times to rest during the day and conserve energy for more important activities. Exercise can help combat fatigue; a simple daily walk with a friend can help. Talk to your healthcare team for helpful tips on dealing with this side effect.

## Nausea and/or Vomiting

Talk to your care team so they can prescribe medications to help you manage [nausea and vomiting](#). In addition, dietary changes may help. Avoid things that may worsen the symptoms, such as heavy or greasy/fatty, spicy or acidic foods (lemons, tomatoes, oranges). Try antacids, (e.g. milk of magnesia, calcium tablets such as Tums), saltines, or ginger ale to lessen symptoms.

Call your doctor or nurse if you are unable to keep fluids down for more than 12 hours or if you feel lightheaded or dizzy at any time.

## Important but Less Common Side Effects

- **Urinary retention:** This is the inability to urinate even when you feel that you need to. If you notice you are unable to urinate, you should call your healthcare team right away or go to the emergency room to be evaluated.
- **Allergic reaction:** Some patients will have an allergic reaction to the medication during the infusion or shortly after. Let your nurse know right away if you have any shortness of breath or difficulty breathing, rash, or swelling of the face.
- **Radiation Recall:** This medication may cause radiation recall. It may present as a skin reaction that looks like a sunburn (redness, swelling, soreness, peeling skin) in areas where radiation was previously given. Notify your oncology care team if you notice this side effect. Treatment can include topical steroid ointments and a delay in your next chemotherapy dose.

## Sexual & Reproductive Concerns

This drug may affect your reproductive system, resulting in the menstrual cycle or sperm production becoming irregular or stopping permanently. Women may experience menopausal effects including hot flashes and [vaginal dryness](#). In addition, the desire for sex may decrease during treatment.

Exposure of an unborn child to this medication could cause birth defects, so you should not become pregnant or father a child while on this medication. Effective birth control is necessary during treatment, even if your menstrual cycle stops or you believe you are not producing sperm. You may want to consider sperm banking or egg harvesting if you may wish to have a child in the future. Discuss these options with your oncology team. You should consult with your healthcare team before breastfeeding while receiving this medication.

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