

Carmustine (BCNU, BiCNU®)

Pronounce: CAR-mus-teen

Classification: Alkylating Agent

About Carmustine (BCNU, BiCNU®)

Carmustine kills cancer cells 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 Carmustine

Carmustine is most often given through intravenous (IV, into a vein) infusion. The dose depends on your size and the tumor type being treated.

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 drug may leak out of the vein at the injection site, causing tissue damage that can be severe. If the area of injection becomes red, swollen, or painful at any time during or after the injection, tell your care team right away. Do not apply anything to the site unless told to do so by your provider.

Your blood count levels can be affected if you take carmustine and cimetidine (Tagamet®) at the same time. Your provider or pharmacist can recommend a different medication to take instead of cimetidine. The blood levels of this medication can be affected by certain foods and medications, so they should be avoided. These include phenobarbital and phenytoin, among others. Be sure to tell your healthcare provider about all medications and supplements you take.

Carmustine comes in a few other formulations, such as a wafer (called Gliadel wafer), that is placed into a surgical cavity after the removal of a brain tumor. It can also be placed directly into an artery, called the intraarterial intracarotid route, that leads to your brain. This type of treatment is still being investigated and can cause problems with your hearing. Carmustine can also be used in a topical formula that is applied to the skin in the treatment of cutaneous lymphoma. The medication stays in the area around the wafer or the application area, so these patients are often not at risk for the following side effects.

Possible Side Effects

There are a number of things you can do to manage the side effects of carmustine. 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:

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. Let your care team 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.

Lung Changes

Carmustine may cause serious pneumonitis and pulmonary fibrosis (a scarring and stiffening of the lung tissue), especially when you have received high doses. These problems can happen months to years after treatment and may be more common in people with pre-existing lung problems. You may have breathing tests (pulmonary function tests) performed every so often. Call your care team right away if you have shortness of breath, cough, wheezing, aching joints and muscles, clubbing of the fingers or toes (enlarged tips and changes in nails), or have a hard time breathing.

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 use of these agents and all over the counter medications/supplements while on therapy.
- Do not floss or use toothpicks. Use a soft-bristle toothbrush to brush your teeth.

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.

Infusion Reactions

The infusion, when given quickly, can cause a reaction that may lead to skin flushing, burning at the injection site, swelling, pain, skin necrosis (death of tissue), and redness in the eye. Reactions are most common during the first week of therapy, including the evening after the infusion. Your provider will tell you what to do if this happens.

Kidney Problems

This medication can cause kidney failure and decreased kidney size, especially in patients who receive large doses or prolonged therapy with carmustine. Your healthcare team will monitor your kidney function throughout your treatment. Notify your healthcare provider if you notice decreased urine output, blood in the urine, swelling in the ankles, or loss of appetite.

Liver Toxicity

This medication can cause liver toxicity, which your oncology care team may monitor for using blood tests called liver function tests. Notify your healthcare provider if you notice yellowing of the skin or eyes, your urine appears dark or brown, or you have pain in your abdomen, as these can be signs of liver toxicity.

Seizures

A seizure is caused by abnormal electrical activity in the brain and can lead to uncontrollable shaking of the body, loss of consciousness, and convulsions. The length and severity of the seizure may vary. If you are experiencing a seizure have someone call 911.

Secondary Malignancies

There is a low risk of developing leukemia or other type of cancer due to treatment with this medication, which can happen many years after treatment. This is most often linked with many treatments or high doses. Your oncology care team will provide instructions on how to best follow up and be monitored for this.

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 and for at least 6 months after treatment for women and 3 months for men. Even if your menstrual cycle stops or you believe you are not producing sperm, you could still be fertile and conceive. You should not breastfeed while receiving this medication.

Sexual and Reproductive Concerns

This medication can affect the male reproductive system, causing sperm production to become irregular or stop permanently. Additionally, sexual desire may decrease during treatment. You may want to consider sperm banking if you want 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 and for at least 6 months after treatment for women and 3 months for men. Even if your menstrual cycle stops or you believe you are not producing sperm, you could still be fertile and conceive. You should not breastfeed while receiving this medication.

Cisplatin (Platinol®)

Pronounce: SIS-plat-in

Classification: Platinum Coordination Complex

About Cisplatin (Platinol®)

Cisplatin is a heavy metal compound that inhibits synthesis of RNA, DNA, and protein in cells. All of these compounds are vital for cells to divide and grow. By preventing them from dividing, the medication can stop cancer from growing.

How to Take Cisplatin

Cisplatin is given through intravenous (IV, into a vein) infusion. The dose and schedule are determined by your

size and type of cancer. You will be given IV fluids prior to receiving cisplatin. It can be given alone or with other drugs.

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 anytime during or after the injection, notify your care team right away. Do not apply anything to the site unless told to do so by your care team.

This medication can affect the blood levels of some anti-seizure medications. Be sure to tell your healthcare provider about all medications and supplements you take.

Possible Side Effects

There are a number of things you can do to manage the side effects of cisplatin. 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:

Kidney Problems

This medication can cause kidney problems, including an increased creatinine level, which your oncology care team will monitor for using blood tests. Notify your healthcare provider if you notice decreased urine output, blood in the urine, swelling in the ankles, or loss of appetite.

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 your 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.

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 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.

Hearing Problems

Cisplatin can cause hearing loss and ringing in the ears. Your hearing will be checked prior to you receiving cisplatin and as needed throughout treatment. Call your doctor or nurse if you have ringing in your ears or if you notice a decrease in your hearing.

Allergic Reactions

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. If you notice any changes in how you feel during the infusion, let your nurse know immediately. The infusion will be slowed or stopped if this occurs. Depending on the severity of your reaction, you may still be able to receive the medication with a pre-medication to prevent a reaction, or if the medication is given at a slower rate.

Less common, but important side effects can include:

- **Electrolyte Abnormalities:** This medication can affect the normal levels of electrolytes (potassium, magnesium, calcium, etc.) in your body. Your levels will be monitored using blood tests. If your levels become too low, your care team may prescribe specific electrolytes to be given by IV or taken by mouth. Do not take any supplements without first consulting with your care team.
- **Taste and Smell Changes:** 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. Ask your nurse about nutritional counseling services to help with food choices.
- **Vision Changes:** This medication can cause blurred vision and a change in color perception, especially

with higher doses or increased frequency of doses. Report any vision changes to your healthcare team immediately.

- **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.
- **Posterior Reversible Encephalopathy Syndrome (PRES):** In rare cases, this medication has caused a neurological disorder called posterior reversible encephalopathy syndrome (PRES), also called reversible posterior leukoencephalopathy (RPLS). Symptoms of PRES/RPLS include headache, seizure, lethargy, confusion, blindness, and other visual and neurological disturbances. Report any of these symptoms to your healthcare team immediately.

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. For women, effective birth control is necessary during treatment and for at least 14 months after treatment, even if your menstrual cycle stops. For men, effective birth control is necessary during treatment and for at least 11 months after treatment, even if you believe you are not producing sperm. You should consult with your healthcare team before breastfeeding while receiving this medication.

Dacarbazine (DTIC, DTIC-Dome®)

Pronounce: da-KAR-ba-zeen

Classification: Alkylating Agent

About Dacarbazine (DTIC, DTIC-Dome®)

Dacarbazine 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.

How to Take Dacarbazine

Dacarbazine is given through intravenous (IV, into a vein) infusion. The dosage and schedule are determined by the person's size, type of cancer, and treatment regimen. It can be given alone or with other medications.

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 Dacarbazine

There are a number of things you can do to manage the side effects of dacarbazine. 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:

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 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 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.

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.

Liver Problems

This medication can affect your liver including serious conditions called hepatic vein thrombosis (blood clot in the liver) and hepatocellular necrosis (death of liver cells). Call your care provider right away if you have yellowing of the skin or eyes, if your urine appears dark or brown, or if you have pain in your abdomen (belly).

Secondary Malignancies

There is a very low risk of developing another type of cancer, including fibrosarcoma, sarcoma, or angiosarcoma

due to treatment with this medication, which can occur many years after treatment.

Nausea and/or Vomiting

Limiting food intake for 4-6 hours before receiving the medication may help with these side effects. Talk to your doctor or nurse 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.

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 nurse 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.

Flu-Like Symptoms

Dacarbazine can cause fever, body aches, and sometimes a rash. You may also experience weakness and headaches. These symptoms generally do not last long. These symptoms usually occur during the treatment and stop after the treatment is discontinued. Call your doctor or nurse for fever greater than 100.4 °F or 38°C or any other symptom listed. Drink plenty of fluids.

Less common, but important side effects can include:

- **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.
- **Sun Sensitivity:** This medication can make your skin more sensitive to the sun, which can result in severe sunburn or rash. Sun sensitivity can last even after chemotherapy is completed. Avoid the sun between 10-2 pm, when it is strongest. Wear sunscreen (at least SPF 15) every day; wear sunglasses, a hat, and long sleeves/pants to protect your skin and seek out shade whenever possible.
- **Allergic Reactions:** 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. If you notice any changes in how you feel during the infusion, let your nurse know immediately.

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 not breastfeed while on this medication.

Tamoxifen (Nolvadex®)

Pronounce: ta-MOX-i-fen

Classification: Anti-estrogen

About Tamoxifen (Nolvadex®)

Tamoxifen works by blocking estrogen receptors in breast tissue. While estrogen may not actually cause breast cancer, it is necessary for the cancer to grow in estrogen receptor-positive breast cancers. With estrogen blocked, the cancer cells that feed off estrogen may not be able to survive.

How to Take Tamoxifen

Tamoxifen is available in tablet form to be taken orally (by mouth). It should be taken around the same time every day. This medication should be swallowed whole with a full glass of non-alcoholic liquid. Do not crush, chew or break the tablets. A liquid version (Soltamox®) of this medication is also available. Talk with your provider if you have trouble swallowing pills. If you miss a dose take it as soon as you remember. If it is close to your next scheduled dose do not double your dose, rather skip the missed dose and continue your regular 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.

The blood levels of this medication can be affected by certain medications and supplements. These include: warfarin, paroxetine, fluoxetine, and amiodarone among others. Make sure your providers are aware of all medications (over-the-counter and prescription) and supplements you are taking.

Storage and Handling

Store this medication at room temperature in the original container. If you prefer to use a pillbox, discuss this with your oncology pharmacist. Ask your oncology team where to return any unused medication for disposal. Do not flush down the toilet or throw in the trash.

Where do I get this medication?

Tamoxifen is available through retail and mail order pharmacies. Your oncology team will give you a prescription, which you can fill at your local pharmacy.

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, may be available. Your care team can help you find these resources if they are available.

Possible Side Effects of Tamoxifen

There are a number of things you can do to manage the side effects of tamoxifen. 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:

Endometrial Cancer

There is a very small risk of developing endometrial (uterine) cancer while taking this medication. Healthcare professionals believe that the benefits of this medication outweigh this risk. Women should report any menstrual irregularities, vaginal bleeding, pelvic pressure/pain, or any vaginal discharge, as these may be symptoms of endometrial cancer. An endometrial biopsy should be done if any concerning symptoms occur.

Blood Clots and Stroke

This medication increases the risk of developing a blood clot, which most frequently occurs in the calves, and can travel from there to the lungs. Blood clots can also cause a stroke. Women at higher risk for developing blood clots include those with a family history of blood clots, heavy smokers, those who have an inactive lifestyle, older women, and those with other predisposing medical problems. Women with any one of these risk factors may want to consider another therapy that does not have this side effect.

Being immobile increases the risk of a blood clot. You should stop taking this medication 3 days prior to and during any prolonged immobilization (hospitalization or bed rest). When traveling, be sure to get up and move around frequently to reduce the risk of a clot.

Signs of a blood clot in the leg may include any of the following: leg pain, warmth, swelling of one leg more than the other. Signs of a blood clot in the lung could include: fever, shortness of breath that comes on very quickly, racing heart, chest pain (that tends to be worse when you take a deep breath). Signs of a stroke include: numbness or weakness on one side of the body, trouble talking, confusion, or mental status changes. *If you have any of these signs or symptoms of blood clots, you will need to be seen immediately so that you can be treated. Blood thinners can be given. Call your healthcare provider.*

Hot Flashes

There are a few things you can do to help with hot flashes. Several medications have been shown to help with symptoms, including clonidine (a blood pressure medication), low doses of certain antidepressants (such as venlafaxine and fluoxetine), and gabapentin. Talk to your healthcare team about these prescription products to determine if they are right for you.

Non-medical recommendations include:

- Keep well-hydrated with eight glasses of water daily.
- Drink ice water or apply an ice pack at the onset of a hot flash.
- Wear cotton or lightweight, breathable fabrics and dress in layers so you can adjust as needed.
- Exercise on a regular basis.
- Try practicing meditation or relaxation exercises to manage stress, which can be a trigger.
- Avoid triggers such as warm rooms, spicy foods, caffeinated beverages, and alcohol.

Vaginal Discharge and Bleeding

This medication can cause increased vaginal discharge. White/clear discharge is normal. Report any bloody or foul-smelling discharge to your healthcare provider immediately.

Menstrual Changes

Your periods may become irregular or stop all together. In some women, normal periods resume after completing tamoxifen therapy. However, women who are already post-menopausal at the time they start tamoxifen should report any vaginal bleeding to their oncologist, primary physician or gynecologist. You will

need to be checked to determine why you are bleeding. Tamoxifen can stimulate the lining of the uterus to grow, which can result in uterine polyps, and rarely, in uterine cancer.

Nausea and/or Vomiting

Talk to your healthcare provider 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.

Cataracts

Women on tamoxifen have an increased risk of developing cataracts. You should have a yearly eye exam by an ophthalmologist. Report any vision changes, cloudy or blurry vision, difficulty with night vision, sensitivity to light, fading or yellowing of colors, as these can be symptoms of cataracts.

Vaginal Dryness

[Vaginal dryness](#), itching, and related painful intercourse are one of the more common side effects of cancer therapy in women. Vaginal lubricants and moisturizers (longer-lasting form of moisturizers) can help with these concerns. Talk to your healthcare team for more suggestions in managing this side effect.

Weakening of the Bones (Osteoporosis)

Premenopausal women who take hormone therapy for extended periods of time are at risk for [bone thinning](#) (osteoporosis). In post-menopausal women, tamoxifen preserves bone strength. You may be advised to take calcium and vitamin D supplements to help prevent bone loss. Weight-bearing exercise and a healthy diet rich in calcium and vitamin D can also help protect your bone health. You may have a bone density scan (DEXA scan) to assess your bone health. If your healthcare provider determines that you are at high risk of developing osteoporosis, they may recommend additional treatment with a type of medication called a bisphosphonate to help strengthen the bones.

Liver Toxicity

This medication can cause liver toxicity, which your healthcare provider may monitor for using blood tests called liver function tests. Notify your healthcare provider if you notice yellowing of the skin or eyes, your urine appears dark or brown, or pain in your abdomen, as these can be signs of liver toxicity.

Radiation Recall

While rare, tamoxifen can lead to 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.

Bone Metastases

Patients with cancer that has spread to the bone may experience pain or discomfort at the tumor site after starting this medication, but this should decrease over time and should be managed with pain medication.

Less common but important side effects:

- **Muscle and joint aches:** Acetaminophen may help with these side effects. Talk to your care provider if they become bothersome.
- **Weight gain:** Weight gain can occur and can be managed with dietary modifications and exercise.
- **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.

- **Mood changes or depression:** Please talk to your healthcare provider if you feel that you experience depressed moods, loss of interest in activities, or changes in sleep and eating habits.
- **Hypercalcemia:** Patients with bone metastases may develop hypercalcemia (high levels of calcium in the blood) and may require hospitalization to correct this. Symptoms of hypercalcemia include increased thirst and urination, nausea, constipation, muscle weakness, confusion, or changes in mental status. Report any symptoms to your care provider.

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 non-hormonal birth control (such as condoms) is necessary during treatment and for at least 2 months after treatment, even if your menstrual cycle stops or you believe you are not producing sperm. You should not breastfeed while receiving this medication.

OncoLink is designed for educational purposes only and is not engaged in rendering medical advice or professional services. The information provided through OncoLink should not be used for diagnosing or treating a health problem or a disease. It is not a substitute for professional care. If you have or suspect you may have a health problem or have questions or concerns about the medication that you have been prescribed, you should consult your health care provider.