OncoLink
Abramson Cancer Center of the University of Pennsylvania

# Cisplatin (Platinol®)

**Pronounced:** SIS-plat-in
**Classification:** Platinum Coordination Complex

## About Cisplatin

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 the cancer from growing.

## How to Take Cisplatin

Cisplatin is given through intravenous (into a vein) infusion. The dose and schedule is determined by the person's size and type of cancer. It can be given alone or with other drugs.

## Possible Side Effects of Cisplatin

There are a number of things you can do to manage the side effects of Cisplatin. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common 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), 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 bath 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.

For more suggestions, read the Neutropenia Tip Sheet.

**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 doctor or nurse 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. Read the anemia tip sheet for more information.

**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 doctor or nurse know if you have any excess bruising or bleeding, including nosebleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (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®, Aleve®, Advil®, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

**Nausea and/or Vomiting**

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. 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. Read the Nausea & Vomiting Tip Sheet for more suggestions.

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**

Visit OncoLink's section on Nutrition for tips on dealing with this side effect. Ask your nurse about nutritional counseling services.

- 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 dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months.
- 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.
- Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can also add flavor to vegetables.

**Sexual and Reproductive Changes**

This drug can 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 – read more about coping with 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 your sperm is affected. 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. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

**Kidney and Liver Function Changes**

Your doctor may order some blood tests to check your liver and kidney function, as these can be affected by cisplatin. Call your doctor or nurse immediately if you have abdominal pain, if your urine becomes dark, or if your skin or the whites of your eyes become jaundiced (yellow in color).

**Peripheral Neuropathy (Numbness or Tingling in the Hands and/or Feet)**

Peripheral neuropathy is a toxicity that affects the nerves. It causes a numbness or tingling feeling in the hands and feet, often in the pattern of a stocking or glove. This can get progressively worse with additional doses of the drug. In some people, the symptoms slowly resolve after the drug is stopped, but for some it never goes away completely. You should let your healthcare provider know if you experience numbness or tingling in the hands and feet, as they may need to change the doses of your medication. See OncoLink's section on peripheral neuropathy for tips on dealing with this side effect.

**Electrolyte Changes**

Your doctor may order blood tests to check your electrolytes. If needed, the doctor may prescribe supplements such as magnesium or potassium.

**Hearing Loss**

Cisplatin can cause hearing loss. Call your doctor or nurse if you have ringing in your ears or if you notice a decrease in your hearing.

# Dacarbazine (DTIC, DTIC-Dome®)

**Pronounced:** da-KAR-ba-zeen
**Classification:** Alkylating Agent

## About Dacarbazine

Dacarbazine exerts its anti-cancer affect 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 (into a vein) infusion, over a period of 30-60 minutes. The dosage and schedule is determined by the person's size, type of cancer, and mode of administration. It can be given alone or with other drugs.

Even when carefully and correctly administered by trained personnel, this drug may cause feeling of burning and pain. Also there is a risk that this drug may leak out of the vein at the injection site, resulting in a localized skin irritation. If the area of injection becomes red, swollen, or painful at anytime during or after the infusion, notify your doctor or nurse immediately. Do not apply anything to the site unless instructed by your doctor or nurse.

## Possible Side Effects of Dacarbazine

There are a number of things you can do to manage the side effects of Dacarbazine. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common 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), 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 bath 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.

For more suggestions, read the Neutropenia Tip Sheet.

**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 doctor or nurse 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. Read the anemia tip sheet for more information.

**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 doctor or nurse know if you have any excess bruising or bleeding, including nosebleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (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®, Aleve®, Advil®, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

**Nausea and/or Vomiting**

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. 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. Read the Nausea & Vomiting Tip Sheet for more suggestions.

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**

Visit OncoLink's section on Nutrition for tips on dealing with this side effect. Ask your nurse about nutritional counseling services.

- 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 dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months.
- 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.
- Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can also add flavor to vegetables.

**Sexual and Reproductive Changes**

This drug can 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 – read more about coping with 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 your sperm is affected. 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. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

**Taste and Smell Changes**

You may experience a metallic taste or dislike foods or beverages that you liked before receiving chemotherapy. These symptoms can last up to several months. 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. Flavor meat or fish by marinating it in sweet juices, sweet and sour sauce or dressings. Use seasonings like basil, oregano or rosemary. Bacon, ham and onion can add flavor to vegetables. Ask your nurse about nutritional counseling services.

**Flu-Like Symptoms**

Dacarbazine can cause fever, body aches and sometimes a rash. You may also experience weakness and headache. 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 > 100.4F or any other symptom listed. Drink plenty of fluids.

**Sun Sensitivity**

Your skin will be 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

10-2pm, when it is strongest. Wear sunscreen (at least SPF 15) everyday; wear sunglasses, a hat and long sleeves/pants to protect your skin.

**Secondary Malignancies**

There is a slight risk of developing leukemia or other type of cancer due to treatment with this medication. This is most often associated with repeated treatments or high doses.

# Carmustine (BCNU, BiCNU®)

**Pronounced:** CAR-mus-teen
**Classification:** Alkylating Agent

## About Carmustine

Carmustine exerts its anti-cancer affect 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 Carmustine

Carmustine is most often given through intravenous (into a vein) infusion. The dosage depends on the person's size and the tumor type being treated. It can be given as a single dose or divided doses over a number of weeks and can be given alone or with other drugs.

Carmustine also comes in the form of a wafer (called Gliadel wafer), which is placed into a surgical cavity after the removal of a brain tumor. The medication remains in the area around the wafer, therefore these patients are not at risk for the following side effects.

## Possible Side Effects of Carmustine

There are a number of things you can do to manage the side effects of Carmustine. Talk to your doctor or nurse about these recommendations. They can help you decide what will work best for you. These are some of the most common 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), 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 bath 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.

For more suggestions, read the Neutropenia Tip Sheet.

**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 doctor or nurse 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. Read the anemia tip sheet for more information.

**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 doctor or nurse know if you have any excess bruising or bleeding, including nosebleeds, bleeding gums or blood in your urine or stool. If your platelet count becomes too low, you may receive a transfusion of platelets.

- Do not use a razor to shave (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®, Aleve®, Advil®, etc. as these can all increase the risk of bleeding. Unless your healthcare team tells you otherwise, you may take acetaminophen (Tylenol).
- Do not floss or use toothpicks and use a soft-bristle toothbrush to brush your teeth.

Read the thrombocytopenia tip sheet for more information.

**Nausea and/or Vomiting**

Take anti-nausea medications as prescribed. If you continue to have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. 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. Read the Nausea & Vomiting Tip Sheet for more suggestions.

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.

**Nail and Skin Changes**

Your fingernails/toenails may become dark, brittle or fall off. You may notice dry skin or changes in the color or tone of your skin. Your skin will be 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 10-2pm, when it is strongest. Wear sunscreen (at least SPF 15) everyday; wear sunglasses and long sleeves/pants to protect your skin. Keep your fingernails and toenails clean and dry. You may use nail polish, but do not wear fake nails. Notify your doctor or nurse if any nails fall off. For more suggestions, read theNail and Skin Care Tip Sheet.

**Sexual and Reproductive Changes**

This drug can 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 – read more about coping with 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 your sperm is affected. 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. See OncoLink's section on sexuality for helpful tips for dealing with these side effects.

**Lung Changes**

Carmustine may cause serious pulmonary fibrosis (a scarring and stiffening of the lung tissue), particularly when high doses have been received. These problems can develop months to years after treatment is completed and may be more common in people with pre-existing lung conditions. You may have breathing tests (pulmonary function tests) performed periodically. **Call your physician right away if you have shortness of breath, cough, wheezing or difficulty breathing**.

**Liver Changes**

Your doctor may order some blood tests to check your liver function. Call your doctor or nurse immediately if you have abdominal pain, if you pass dark urine, or if your skin or the white of your eyes become jaundiced (yellow in color).

**Kidney Changes**

Your doctor may order blood tests to check your kidney function. Try to drink at least 6-8 glasses of fluid a day. Call your doctor or nurse if you don't urinate for more than 12 hours.

# Tamoxifen (Nolvadex®)

**Pronounced:** ta-MOX-i-fen
**Classification:** Antiestrogen

# About Tamoxifen

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 comes in pill form to be taken orally (by mouth). The usual dose is 20-40mg per day. Take this medication should be swallowed whole (do not chew or break) with a full glass of water.

# Possible Side Effects of Tamoxifen

There are a number of things you can do to manage the side effects of Tamoxifen. Talk to your doctor or nurse 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

If you have nausea or vomiting, notify your doctor or nurse so they can help you manage this side effect. They may prescribe anti-nausea medications. 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. Read the Nausea & Vomiting Tip Sheet for more suggestions.

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.

## Hot Flashes

There are a few things you can do to help with hot flashes. Several medications have been studied, including clonidine (a blood pressure medication), some low dose antidepressants (such as venlafaxine and Prozac), and gabapentin. Non-medical recommendations include: keeping well-hydrated with eight glasses of water daily, wearing all-natural fiber clothes, dressing in layers, exercising on a regular basis (generally walking exercise is best), practicing relaxation exercises, and avoiding triggers such as warm rooms, spicy foods, caffeinated beverages, and alcohol.

## Vaginal Bleeding

Some vaginal bleeding can be normal. This may be due to irregular periods that can result from having had chemotherapy. Vaginal bleeding may also be due to the natural change into menopause. 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.

## Uterine (Endometrial) Cancer

In clinical trials, women taking tamoxifen were more likely to have endometrial cancer as compared to women who took placebo. This risk was very small, and doctors believe that the benefits of tamoxifen outweigh this risk. Women should promptly 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 to test for cancer if any of these symptoms occur.

## Cataracts

Women on tamoxifen have an increased risk of getting cataracts. You should get 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.

## Blood Clots

Blood clots are a rare side effect that can occur anywhere in the body. They occur most frequently in the calves or the lungs. Women at risk for developing blood clots include those with a family history of blood clots, smokers, those who have an inactive lifestyle, older women, and those with other medical problems. Women with any one of these risk factors may want to consider another therapy that does not have this side effect.

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 you very quickly, racing heart, chest pain (that tends to be worse when you take a deep breath).

***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 doctor or nurse.***

## Depression

Depression may occur as a result of some of the biological changes occurring in your body and/or your emotional response to some of these changes. Either way, symptoms of depression may include sadness, sleep and appetite changes, as well as a lack of desire to do the activities you once enjoyed. This is very treatable. Please talk to your doctor or nurse if you feel that you are experiencing any of these symptoms.

## Fatigue

While on cancer treatment 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 and see OncoLink's section on fatigue for helpful tips on dealing with this side effect.

## Vaginal Dryness

Vaginal dryness and related painful intercourse is one of the more common side effects of cancer therapy. Vaginal lubricants and moisturizers can help with these concerns. Learn more about specific recommendations for dealing with this side effect. In addition, the desire for sex may decrease during treatment.


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