Carboplatin (Paraplatin®)

Pronounce: car-boe-PLATT-in

Classification: Platinum Chemotherapies

About Carboplatin (Paraplatin®)

Carboplatin is a heavy metal compound that affects the RNA, DNA, and protein in cells. By preventing cancer cells from dividing, the medication can stop the cancer from growing.

How to Take Carboplatin

Carboplatin is given by intravenous (IV, into a vein) injection. Your dose is based on your size, kidney function, and type of cancer. 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, casuing tissue damage that can be severe. If the area of injection becomes red, swollen, or painful at anytime during or after the injection, tell your care team right away. Do not apply anything to the site unless instructed by your care team.

Carboplatin can interact with certain medications including some antibiotics, diuretics and blood thinners. 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 carboplatin. 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 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.

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.

Electrolyte Changes

This medication can affect the normal levels of electrolytes (sodium, 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.

Liver Toxicity

This medication can cause liver toxicity, which you will be monitored for using blood tests called liver function tests. If you develop elevations in your liver function tests, your healthcare provider may need to lower your dose or stop the medication. 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.

Kidney Problems

Carboplatin can impact your kidney function. Your healthcare team will monitor your kidney function throughout treatment. Try to drink at least 6-8 glasses of uncaffeinated fluids a day. Call your doctor or nurse if you do not urinate for more than 12 hours.

Live Vaccines

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®), rotovirus and yellow fever vaccines.

Less common, but important side effects can include:

- ***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.
- ***Allergic Reactions***: In some cases, patients can have an allergic reaction to this medication. Signs of a reaction can include: rash, itching, hives, flushing, and/or shortness of breath or difficulty breathing. 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.
- ***Vision/Hearing Changes***: In rare cases, this medication can cause changes to hearing and vision. Contact your care team if you notice ringing in your ears, decrease in hearing, or changes in your vision.

Reproductive Concerns

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 could still be fertile and conceive. You should not breastfeed while receiving this medication.

Cetuximab (Erbitux®)

Pronounce: se-TUX-i-mab

Classification: Monoclonal Antibody

About Cetuximab (Erbitux®)

Monoclonal antibodies are created in a lab to attach to the targets found on specific types of cancer cells. The antibody “calls” the immune system to attack the cell it is attached to, resulting in the immune system killing the cell. These antibodies can work in different ways, including stimulating the immune system to kill the cell, blocking cell growth or other functions necessary for cell growth.

Cetuximab is a man-made version of a naturally occurring human/mouse antibody that inhibits the epidermal growth factor receptor (EGFR). The EGFR is a protein that is abnormally over-expressed in many cancers, and the inhibition of EGFR results in a decrease in tumor cell growth and decreased production of other factors responsible for metastasis (spreading of cancer). This medication treats both head and neck and colorectal cancer. The colorectal cancer needs to test positive for the k-ras wild type. Your cancer cells will be tested for this mutation.

How to Take Cetuximab

Cetuximab is given through intravenous (IV, into a vein) infusion. The dose is based on your size and how often you receive the medication depends on which disease you are being treated for and what other treatments you are receiving. Before your first dose, you will be given a pre-medication such as diphenhydramine (Benadryl) to prevent an infusion reaction. Whether or not you receive pre-medications before subsequent doses will be at the discretion of your care team. Your dose may be changed if you have a reaction to the medication.

Possible Side Effects

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

Infusion Reaction

Some patients will develop a reaction to the medication. This most commonly occurs with the first dose. Reactions can cause chills, fever, shortness of breath, difficulty breathing, hoarseness, itching, or low blood pressure. Tell your nurse right away if you experience any of these. You will be given medication prior to the infusion to help prevent this reaction. You will be monitored for at least 1 hour after the completion of your infusion.

Heart Problems

Cetuximab can cause heart problems including cardiac arrest and heart attack. Patients with a prior history of coronary artery disease and/or receiving radiation therapy are at highest risk. Notify your healthcare team or go to the emergency room immediately if you experience chest pain, shortness of breath, or feel dizzy or faint.

Electrolyte Abnormalities

This medication can impact the electrolyte levels in your blood; including magnesium, calcium, and potassium. This can even occur after the completion of treatment. Your healthcare team will monitor your electrolyte levels during treatment, and for at least 8 weeks following the completion of treatment.

Nail and Skin Changes

Cetuximab has some unique nail and skin side effects that you may develop. Patients may develop a rash. While this rash may look like acne, it is not, and should not be treated with acne medications. The rash may appear red, swollen, crusty and dry, and feel sore. You may also develop very dry skin, which may crack, be itchy, or become flaky or scaly. The rash may be the worst during the first few weeks of treatment but may continue until treatment is stopped. Tips for managing your skin include:

- Use a thick, alcohol-free emollient lotion or cream on your skin at least twice a day, including right after bathing.
- Sun exposure can worsen the rash. Use a sunscreen with an SPF of 30 or higher and wear a hat and sunglasses to protect your head and face from the sun.
- Bathe in cool or lukewarm water and pat your skin dry.
- Use soaps, lotions, and laundry detergents without alcohol, perfumes, or dyes.
- Wear gloves to wash dishes or do housework or gardening.
- Drink plenty of water and try not to scratch or rub your skin.
- Notify your healthcare team if you develop a rash as they may have management suggestions and/or prescribe a topical medication to apply to the rash or an oral medication.

While receiving cetuximab, you may develop an inflammation of the skin around the nail bed/cuticle areas of toes or fingers, which is called paronychia. It can appear red, swollen or pus filled. Nails may develop "ridges" in them or fall off. You may also develop cuts or cracks that look like small paper cuts in the skin on your toes, fingers or knuckles. These side effects may appear several months after starting treatment but can last for many months after treatment stops.

- Follow the same recommendations for your skin (above).
- Don't bite your nails or cuticles or cut the cuticles.
- 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 or you develop any of these side effects or other skin

abnormalities.

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. Limit sun exposure while receiving this medication, and for two months following the last dose. 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 and seek out shade whenever possible.

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 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.

Muscle or Joint Pain/Aches and Weakness

Your healthcare provider can recommend medications and other strategies to help relieve pain.

Less common, but important side effects can include:

- ***Hair Changes***: While receiving cetuximab, your eyelashes may grow very fast, become very long, and bother your eyes. Speak to your provider about how to best manage this side effect. The hair on your head may become curly, fine, or brittle. These changes tend to resolve once treatment is stopped.
- ***Lung Problems***: Cetuximab can cause interstitial lung disease (ILD), especially in those with pre-existing lung problems. 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.

Reproductive Concerns

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. If you do become pregnant, your care team will decide whether or not you should receive the medication. Effective birth control is necessary during treatment and for 2 months after treatment has stopped. 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, and for 2 months after your last treatment.

Gemcitabine (Gemzar®)

Pronounce: jem-SYE-ta-been

Classification: Antimetabolite

About Gemcitabine (Gemzar®)

Gemcitabine is a type of medication called an “antimetabolite.” Antimetabolites affect the DNA of cancer cells, leading to the slowing or stopping of cancer. Since cancer cells divide faster and with less error-correcting than healthy cells, cancer cells are more sensitive to this damage than normal cells.

How to Take Gemcitabine

Gemcitabine is given by intravenous (IV, into a vein) infusion. The dosage and schedule will be determined by your size and type of cancer. It can be given alone or with other medications or therapies, such as radiation.

When given at the same time as radiation, there can be more side effects. At least one week should pass in between the start or end of radiation therapy and a full gemcitabine dose. Please make sure all your healthcare providers are aware of your treatment history with gemcitabine and/or radiation.

Patients may experience gemcitabine toxicity if the medication is infused for more than 60 minutes or if the medication is given more than once a week. Side effects of toxicity can include severe flu-like symptoms, fever, low blood pressure, and low blood counts. If you have any of these side effects, let your provider know. You may be told to take medication to manage these side effects and you will be closely monitored for toxicity.

Possible Side Effects of Gemcitabine

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

Liver Toxicity

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

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 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 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.

Rash

Some patients may develop a rash, dry skin, or itching. This rash can become severe, so be sure to let your care team know if you develop a rash. 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.

Fluid Retention / Swelling

Some patients may develop fluid retention, which can cause swelling in the feet and/or ankles or face or gain weight. Fluid can also build up in the lungs and cause you to feel short of breath. Notify your healthcare team if you have any swelling, unexpected weight gain, or shortness of breath.

Less common, but important side effects can include:

- ***Lung Problems:*** This medication may cause pulmonary fibrosis (a scarring and stiffening of the lung tissue), interstitial pneumonitis, pulmonary edema, or acute respiratory distress syndrome (ARDS). These problems can develop during treatment or up to two weeks after treatment is completed. Call your physician right away if you have shortness of breath, cough, wheezing, or difficulty breathing.
- ***Posterior Reversible Encephalopathy Syndrome (PRES):*** PRES is a rare, reversible neurological disorder that can occur with the use of gemcitabine. Symptoms of PRES include seizure, high blood pressure, headache, confusion, fatigue, confusion, any changes in your vision, or difficulty walking or thinking. If you experience any of these symptoms, contact your care team or go to the emergency room immediately.
- ***Hemolytic Uremic Syndrome (HUS):*** This medication can also cause a rare complication called hemolytic uremic syndrome (HUS). Your healthcare team will monitor you for symptoms of HUS throughout your treatment. Notify your healthcare team if you notice changes in the color or amount of your urine or if you develop bleeding or increased bruising.

- ***Capillary Leak Syndrome:*** Capillary leak syndrome is a condition in which blood and components of blood leak out of vessels and into body cavities and muscles. The movement of this fluid out of the vessels can cause hypotension (low blood pressure) and organ failure. Signs and symptoms of capillary leak syndrome include a sudden drop in blood pressure, weakness, fatigue, sudden swelling of the arms, legs, or other parts of the body, nausea, and lightheadedness. If you are having any of these symptoms notify your infusion nurse or provider immediately.
- ***Radiation Recall:*** Radiation recall is when the administration of a medication causes a skin reaction that looks like a sunburn (redness, swelling, soreness, peeling skin) in areas where radiation was previously given. Notify your oncology team if you notice this side effect. Treatment can include topical steroid ointments and a delay in your next chemotherapy dose.

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 6 months after your last dose. For men, effective birth control is necessary during treatment and for 3 months after your last dose.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 or for 1 week after your final dose.