Carmustine (BCNU, BiCNU®)

**Pronounced:** CAR-mus-teen

**Classification:** Alkylating Agent

**About Carmustine (BCNU, BiCNU®)**

Carmustine attacks 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 dosage depends on the person's size and the tumor type being treated. Your complete blood count will be closely monitored before and after treatment.

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, 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.

Your blood count levels can be affected if you take carmustine and cimetidine 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 also comes in a wafer formulation (called Gliadel wafer), which is placed into a surgical cavity after the removal of a brain tumor. In addition, it can be used in a topical formula that is applied to the skin in the treatment of cutaneous lymphoma. The medication remains in the area around the wafer or localized to the application area, therefore these patients are typically 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. 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 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 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), 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, aching of the joints and muscles, clubbing of the fingers or toes, or difficulty 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 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.

**Infusion Reactions**
The infusion, when given rapidly, can cause a reaction that may lead to intense skin flushing, burning at the injection sight, swelling, pain, skin necrosis, and redness in the eye. Reactions are most common during the first week of therapy, including the evening after the infusion. Your doctor or nurse 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 occur many years after treatment. This is most often associated with repeated treatments or high doses. Your oncology care team will provide instructions on how to best follow up and be monitored for this.

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 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.

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