



Cyclophosphamide

What names may be used for this medication?

Cyclophosphamide, Cytosan, Neosar

How and why is this medicine given?

Cyclophosphamide is given by an intravenous (IV) infusion (a slow drip through a needle into your port or through a vein in your arm or hand), and it is also available in a pill form. We use it most commonly in our office for the treatment of ovarian and uterine cancers; and it is almost exclusively used as an IV infusion. It may be used by itself or combined with other chemotherapy drugs.

How does the medicine work?

Cyclophosphamide binds to your body's DNA (the machinery or "brain" that runs each cell) causing damage that prevents the DNA from replicating, which prevents the cell itself from reproducing. Cyclophosphamide is not able to discriminate between good cells and cancer cells, so it can affect many parts of your body besides the cancer. Since non-cancer cells are better than the cancer cells at detecting and repairing the damage caused by cyclophosphamide, the cancer cells die and your normal cells repair the damage so they can resume their normal function. The side effects you experience from cyclophosphamide are a result of this damage to your healthy cells before they have a chance to repair themselves.

Cyclophosphamide must be activated to its active form by your liver. The enzyme systems that cause this activation can be influenced by other medications. It is therefore very important for you to be sure your list of medications that you take for other health problems (such as blood pressure, diabetes, etc.) stays accurate and up to date in our office. We will review your medication list at each visit.

After activation, cyclophosphamide is then cleared from your body by your kidneys. The by-products can be toxic to your bladder, so it is important that you keep yourself well hydrated (8-10 glasses of water per day) in efforts to keep the kidneys working at their best. You should empty your bladder every 2-3 hours during the day. We will monitor your liver and kidney function through blood tests performed prior to each infusion.

How often is this medicine given?

Cyclophosphamide is typically given once every 3-4 weeks (every 21-28 days). The total number of treatment cycles needed will be outlined by your doctor prior to beginning therapy. The infusions are given at the infusion center at the Cancer & Research Center (white building located across the parking lot from our office). Oral cyclophosphamide is of course taken at home after a prescription is filled, but this is rarely used in the treatment of gynecologic cancers. Prior to each treatment, you will be seen in the office for an exam, and blood tests will be reviewed to be sure it is safe to administer your treatment. It is, of course, very important to keep all of your appointments for chemotherapy and lab testing.

What side effects does this medicine cause?

There are many possible side effects of all chemotherapy drugs, so the following is only inclusive of the most common or serious possibilities from cyclophosphamide. You will be asked to complete a symptom form at each visit in order for us to accurately assess the side effects that you may be experiencing. This form helps your doctor be sure that no adverse effects of treatment are overlooked, and it serves to help you recall which symptoms you may have experienced since your last treatment.

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- ❖ Hair loss is common with cyclophosphamide, but hair growth should return upon completion of treatment.
 - ❖ Nausea and vomiting may be experienced with cyclophosphamide. These symptoms are less common today than in the past because of much improved anti-nausea medications. You will be given prescriptions for medications to prevent nausea, and it is important that you take them as directed in order for them to be most effective. If you have questions, do not hesitate to call the office.
 - ❖ Bone marrow suppression is when the bone marrow cannot make enough red cells, white cells, or platelets to keep up with demand, and this is a side effect of most chemotherapy medications, including cyclophosphamide. All of your blood counts will be monitored regularly throughout treatment.
 - ◆ *Anemia* is the result of not enough red blood cells and may cause fatigue, chest pain, shortness of breath, or dizziness.
 - ◆ *Neutropenia* results when your white blood cell count goes too low, and this will put you at an increased risk for infection. It is very important that you avoid sick friends and family; be diligent about hand-washing as well. This does not mean that you cannot be out in public, and in fact you can continue to participate in normal activities such as going to church or a movie, etc. If you think you may have an infection or have a fever of 100.5°F or more, call the office immediately.
 - ◆ *Thrombocytopenia* is the term for too low of a platelet count. This can lead to excessive bruising or bleeding with only minor injury such as brushing your teeth or blowing your nose.
 - ❖ Hyperpigmentation of the skin and nails is commonly seen with cyclophosphamide. This typically regresses after completing treatment.
 - ❖ Bladder toxicity can occur and presents as a *hemorrhagic cystitis* (blood in urine and painful urination). This is minimized and actually quite rare if adequate hydration is maintained. If this occurs, it is typically reversible. You should empty your bladder every 2-3 hours during the day, and you should call the office if you notice bloody urine.
 - ❖ *Mucositis* is sores/ulcers in the mouth that can cause pain and difficulty eating or swallowing. This is not common but can occur with cyclophosphamide. This can be minimized with good oral hygiene and a warm salt-water solution gargled after each meal.
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Prescription medication is also available if these steps are ineffective at resolving your symptoms.

- ❖ A metallic taste is sometimes encountered while taking cyclophosphamide. You may be able to overcome this with stronger flavored herbs such as basil, sage, or thyme.
- ❖ There is a risk of developing secondary malignancies following cyclophosphamide, particularly leukemia and bladder cancer. This is very rare.
- ❖ Cyclophosphamide can cause problems with fertility. It is not uncommon to stop having periods while receiving cyclophosphamide, but these typically return to normal after stopping treatment. Your doctor will discuss this in more detail if applicable to you.
- ❖ If you are pregnant or become pregnant during therapy, you should notify your doctor immediately.

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