



Methotrexate

What names may be used for this medication?

Methotrexate, Folex, Mexate

How and why is this medicine given?

Methotrexate 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), as an IV push (a more rapid intravenous infusion than the drip technique), intramuscularly (IM, which is an injection into the muscle of your arm or bottom), and very rarely intrathecally (into your spinal fluid) to treat many different types of cancers. We use it most commonly in our office for the treatment of gestational trophoblastic disease and occasionally cervical cancer. It may be used by itself or combined with other chemotherapy drugs. With some regimens of methotrexate, a “rescue” drug called Leucovorin (folinic acid) may be given as well. If leucovorin is prescribed, it must be taken EXACTLY as directed.

How does the medicine work?

Methotrexate binds to an enzyme called *dihydrofolate reductase* and prevents this enzyme from creating some of the building blocks (*purines*) for DNA (the machinery or “brain” that runs each cell). This prevents replication of DNA and thus prevents the cell itself from reproducing. *Folic acid supplements may allow the cancer cells to bypass this enzyme system, and therefore these should NOT be taken while receiving methotrexate as they may decrease the drug’s effectiveness.* Methotrexate 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 repairing the damage caused by methotrexate, the cancer cells die and your normal cells repair the damage so they can resume their normal function. The side effects you experience from methotrexate are a result of this damage to your healthy cells before they have a chance to repair themselves.

Methotrexate is activated to its active form in the liver and is later cleared from your body through the kidneys. The kidney's filtering process prevents the drug from staying in your body too long and causing excessive damage to the normal cells. It is therefore important that you keep yourself well hydrated (8-10 glasses of water per day) in efforts to keep the kidneys working at their best. We will monitor both your kidney and liver function through blood tests performed prior to each treatment cycle. We will also review your list of medications that you take for other medical problems (diabetes, blood pressure, etc.) at each visit to be sure that none of these other medicines are interfering with clearing the methotrexate from your body.

How often is this medicine given?

Methotrexate may be given daily for 5 days every other week, weekly, bi-weekly, or by various other administration schedules. The precise timing of treatment and the total number of treatments recommended will vary based on your clinical circumstances. An initial plan will be outlined for you by your doctor at the initiation of therapy. The infusions are typically given in the infusion center at the Cancer & Research Center (white building located across the parking lot from our office), but occasionally a hospital stay may be required. 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 next 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 methotrexate. 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.

- ❖ Hair loss is uncommon with methotrexate, but some patients do experience more hair loss than others. If hair loss occurs, hair growth should return upon completion of treatment.
 - ❖ Nausea and vomiting are not unusual but 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 methotrexate. 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.
 - ❖ *Mucositis* is sores/ulcers in the mouth that can cause pain and difficulty eating or swallowing. This may occur with methotrexate. This can be minimized with good oral hygiene and a warm salt-water solution gargled after each meal. Prescription medication is also available if these steps are ineffective at resolving your symptoms.
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- ❖ Diarrhea is sometimes seen with methotrexate treatments. A bland diet and limiting dairy intake may help. Over the counter agents such as Immodium are safe to use, and should be started with the first watery stool—do not allow yourself to become dehydrated. If you are unable to control your diarrhea with these measures or feel you may be getting dehydrated, please call the office for further instructions.
 - ❖ Skin toxicity with redness, darkening of the skin, rashes, and sensitivity to the sun can occur with methotrexate. Direct sun exposure and tanning beds should be avoided, and sun protection (SPF 15 or higher) should be used liberally while receiving this medication.
 - ❖ With “high dose” methotrexate therapy, other toxicities can be encountered. These may involve the lungs, kidneys, and nervous system. Prolonged exposure to methotrexate may also lead to liver fibrosis or cirrhosis. Since prolonged treatment and “high dose” regimens are only used rarely in gynecologic oncology, further details on these potential side effects will not be discussed here but reviewed by your doctor.
 - ❖ Methotrexate can cause problems with fertility. It is not uncommon to stop having periods while receiving methotrexate, 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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