

## Pregnancy and Immunosuppressives

Cyclophosphamide and methotrexate are unsafe for use during pregnancy. The safety of mycophenolate mofetil during pregnancy is unknown. Azathioprine is unsafe for use during pregnancy because it can cause chromosomal abnormalities.<sup>2</sup> However, it is used on rare occasions when a pregnant woman with SLE has potentially life-threatening kidney disease that cannot be controlled with corticosteroids.

## What to Think About

Taking cyclophosphamide along with corticosteroids is more effective than taking corticosteroids alone in controlling severe SLE kidney disease, reducing tissue damage, and reducing the maintenance dose of corticosteroids.<sup>1</sup>

Combinations of both immunosuppressives and corticosteroids can be very effective but also increase the risk of side effects. The high risk of side effects makes regular follow-up and monitoring by a doctor essential.

Methotrexate is well documented as a treatment for other diseases and conditions involving problematic cell growth, such as cancer. While methotrexate effectiveness for SLE treatment is not well researched, it is becoming more commonly used for milder SLE inflammation and symptoms.<sup>1</sup>

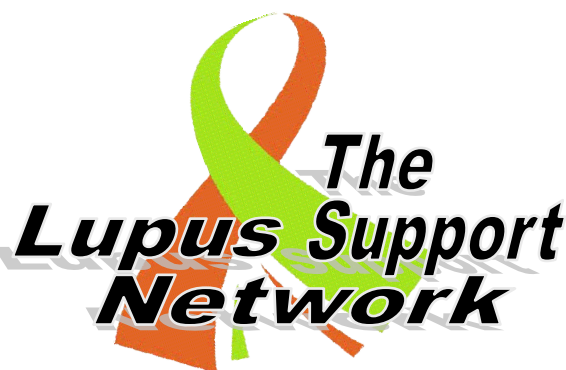
Immunosuppressive and cytotoxic medications have been linked to a slight increase in some cancer risks. However, if you have severe, possibly life-threatening SLE, a medication's risk may be outweighed by its lifesaving potential.



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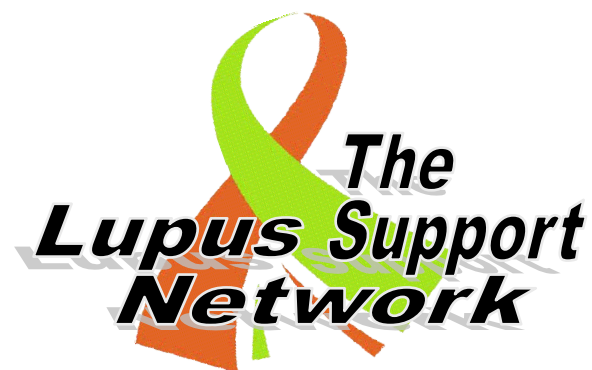
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## Immunosuppressive and Cytotoxic Medications for Systemic Lupus Erythematosus



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## Immunosuppressive and cytotoxic medications for

### systemic lupus

**Examples:** mycophenolate mofetil ( CellCept )  
azathioprine ( Imuran )  
cyclophosphamide ( Cytoxan )  
methotrexate sodium ( Rheumatrex, MTX, Folex )  
cyclosporine (cyclosporin A) ( Neoral, Sandimmune )

Depending on the drug, an immunosuppressive medication may be given in pill form, weekly injections, or by IV pulse therapy (injection given monthly).

Cyclophosphamide (Cytoxan) and methotrexate sodium are also referred to as cytotoxic medications.

### How It Works

Immunosuppressive medications (including cytotoxics) reduce [inflammation](#) and suppress the [immune system](#). In higher doses, cytotoxic medications are also used to treat certain forms of cancer.

### Why It Is Used

Azathioprine, mycophenolate, and cyclophosphamide are the most common immunosuppressive medications used to treat severe [kidney](#) disease associated with systemic lupus erythematosus (SLE).

Cyclosporine is sometimes used to treat a certain type of kidney problem called membranous disease. Its use is limited as an SLE treatment because of its tendency to cause kidney toxicity.

Methotrexate is used to control skin rash and joint pain caused by SLE. It may also be used when a person doesn't tolerate or respond to azathioprine or cyclophosphamide. Methotrexate is more commonly used to treat [rheumatoid arthritis](#).<sup>1</sup>

Immunosuppressive medications can be used with [corticosteroids](#) for severe, extensive skin rashes or other severe symptoms that do not respond to other therapy. Corticosteroids are often gradually reduced as symptoms are controlled.

## How Well It Works

### Azathioprine

Long-term studies suggest that people with severe SLE treated with azathioprine (Imuran) in addition to corticosteroids have:

- Less kidney damage and better long-term kidney function.
- Fewer SLE flares.  
A person who uses this medication may gradually be able to reduce their dose of corticosteroids (as directed by a doctor).

Azathioprine works slowly, and may take 3 to 6 months to reach full effectiveness. After symptoms are well controlled and the dose of corticosteroids has been reduced, it may be possible to gradually reduce the dose of azathioprine and to stop the medication completely.

### Cyclophosphamide

When given [intravenously](#) once a month for 6 months, cyclophosphamide (Cytoxan):

- Reduces inflammation of kidneys and other affected organs.
- Maintains kidney function in up to 80% of people with severe SLE. This benefit, along with fewer disease flares, can be less more effective, yet more toxic than azathioprine. maintained with less frequent treatments over the following 1 to 2 years.<sup>1</sup>
- May not control some of the symptoms other than kidney involvement, so corticosteroids may need to be taken with it.
- Can help control SLE symptoms while corticosteroids are gradually lowered.

### Methotrexate

Methotrexate can effectively control skin rashes and joint pain, but is unproven for controlling more severe lupus symptoms.<sup>1,2</sup>

### Side Effects

The most serious side effects of immunosuppressives are

lowered white blood cell counts and increased risk of infection. Immunosuppressives lower your immunity, making your body less able to defend against viral, bacterial, and fungal infections, such as [shingles](#), staphylococcus, and yeast.

**Azathioprine.** Side effects include hair-thinning, nausea, vomiting, diarrhea, and [liver toxicity](#). Because of an increased risk of precancerous cervical cell changes, women taking azathioprine are advised to have regular [Pap tests](#). Some studies suggest that azathioprine may slightly increase the risk of future [non-Hodgkin's lymphoma](#).<sup>2</sup> Further research is necessary to confirm these findings. Azathioprine is unsafe for use during pregnancy because it can cause chromosomal abnormalities.

**Cyclosporine.** This medication increases the risk of kidney problems and is used infrequently for SLE treatment. However, cyclosporine can be effective when used to treat membranous disease, a kidney condition sometimes associated with SLE.

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**Cyclophosphamide.** Side effects include hair-thinning and nausea during treatment; a slightly increased risk of future skin, bladder, bowel, or blood cancer; ovarian failure, resulting in menopause and permanent infertility; bleeding in the bladder. A monthly intravenous dose (instead of a daily oral dose) reduces the risks of bladder bleeding, allows for more accurate dosing, and if given during menstruation, may reduce the risk of infertility. Intravenous cyclophosphamide may reduce the risk of some cancers, especially bladder cancer, linked to more frequent oral dosing.

**Methotrexate.** Side effects include hair-thinning, skin rash, nausea, vomiting, loss of appetite, fatigue, reduced white blood cell count, mouth ulcers, and liver inflammation or damage. There have been reports of non-Hodgkin's lymphoma occurring in people treated for rheumatoid arthritis with methotrexate. The relationship between methotrexate and non-Hodgkin's lymphoma is not known. Further research is necessary to evaluate methotrexate treatment for SLE.