



Systemic Immunomodulators

Immunomodulators are medications to help regulate or normalise the immune system. It is given in an oral form or intravenously.

Immunomodulators are used to control severe symptoms of skin conditions such as itch and redness.

The treatment and its duration varies between individuals and is dependent on the individual's condition and response to treatment. It may be last for months or years.

Frequent blood tests are required with the use of immunomodulators to monitor its side effects.

It is important that application of prescribed creams is continued together with the use of immunomodulators. The doctor will adjust the use of the creams when the condition improves with treatment.

As immunomodulators reduce the immune system, vaccinations with any live vaccines (e.g. polio and MMR) should be avoided. If any vaccinations is scheduled, please inform the doctor or nurse that you or your child is taking these medications. Flu vaccines are safe.

Some of the commonly prescribed immunomodulators include:

- Ciclosporin
- Azathioprine
- Methotrexate (MTX)

CICLOSPORIN

What dose of ciclosporin should I take?

- The dose of ciclosporin depends on the patient's body weight and usually ranges from 2 mg to 5 mg/kg per day. It is usually taken twice daily.

What monitoring is required?

- Regular monitoring of kidney function by blood tests and monitoring of the blood pressure is required when on ciclosporin.
- Other blood and urine tests may be ordered by the doctor during treatment.

What are the possible side effects?

- Side effects include flu-like symptoms, nausea, abdominal pain, diarrhoea, gum overgrowth, tiredness, excessive hair growth, mild tremor, headaches and raised levels of lipids (e.g. cholesterol) in the blood.
- Long-term side effects include decreased function of the kidneys and raised blood pressure. If these are detected during treatment, the dosage will be adjusted accordingly. These side effects are reversible if detected early with prompt adjustments to medication dosing.
- Other less common side effect includes increased susceptibility to serious infections (e.g. tuberculosis, hepatitis).
- If taken for a long duration, there is an increased risk of certain cancers such as skin cancer and lymphomas.
- If you experience any visual or hearing changes, severe headache and tremors, or signs of kidney problems (usually manifested as swelling of hands and feet or inability to pass urine), please stop ciclosporin and seek immediate medical attention.

Can I take other medications at the same time?

- Ciclosporin may interact with many other drugs if they are taken at the same time. Do inform all doctors and medical professionals that you or your child is taking ciclosporin. Do not take over-the-counter drugs or dietary supplements without discussing first with your doctor or pharmacist.
- Common medications that may interact with ciclosporin include:
 - **Antibiotics:** macrolide antibiotics such as erythromycin and sulfonamide antibiotics such as co-trimoxazole
 - **Antifungals:** fluconazole, itraconazole, ketoconazole and amphotericin B
 - **Anti-epileptics:** phenytoin and carbamazepine
 - **Blood pressure medications:** ACE inhibitors, beta-blockers and calcium channel blockers
 - **Non-steroidal anti-inflammatory drugs (NSAIDs)**
 - **Lipid/cholesterol-lower medications:** statins and fibrates

You should avoid eating grapefruit, pomelo, pineapple or starfruit while you are taking ciclosporin as these are known to affect the absorption of ciclosporin.

AZATHIOPRINE

What dose of azathioprine should I take?

- The dose of azathioprine depends on the patient's body weight and usually ranges from 1 mg to 3 mg/kg per day. It is usually taken after food once daily, at the same time each day.

What monitoring is required?

- Regular monitoring with liver function tests (LFT) and full blood counts (FBC) is required when on azathioprine.

- Before starting treatment, the doctor may order a test to check for the function of a protein that helps to break down azathioprine (thiopurine methyltransferase or TPMT).

What are the possible side effects?

- Side effects include flu-like symptoms, dizziness, nausea, vomiting and abdominal pain.
- Rarely, patients may be allergic to azathioprine. If you develop itchy rashes or hives; red, swollen, blistered, or peeling skin with or without fever; wheezing; tightness in the chest or throat; difficulty breathing or talking; unusual hoarseness; swelling of the mouth, face, lips, tongue or throat, please stop medicine and seek immediate medical attention.
- Azathioprine can affect liver and bone marrow function. These are monitored regularly during treatment with blood tests.
- If taken for a long duration, there is an increased risk of certain cancers such as skin cancer and lymphomas.

Can I take other medications at the same time?

- Do inform all doctors and medical professionals that you or your child is taking azathioprine. Do not take over-the-counter drugs or dietary supplements without discussing first with your doctor or pharmacist.
- Allopurinol should not be taken together with azathioprine.
- Care should be taken if certain other drugs are used together with azathioprine. These include warfarin, ribavirin, co-trimoxazole, ACE inhibitors and trimethoprim.
- Alcohol should be avoided if possible or kept to a minimum as suggested by your doctor because alcohol may increase the risk of liver toxicity associated with azathioprine.

METHOTREXATE (MTX)

What dose of methotrexate should I take?

- The dose of MTX depends on the patient's body weight. MTX tablets are 2.5 mg per tablet. Always follow the instructions of the doctor regarding the MTX dose.
- **MTX is usually taken in tablet form once a week, on the same day each week. It should never be taken every day.** MTX is taken on empty stomach (half to an hour before food or two hours after food) for best absorption and should be swallowed whole, not crushed or chewed. However, you may take it with food if you experience stomach discomfort taking it on empty stomach.
- MTX may also be given once a week by injection.
- The doctor may prescribe a small dose at first and gradually increased until it is effective.
- If you miss taking methotrexate on your normal day, take it as soon as you remember if this is within 48 hours of the scheduled dose. For example, scheduled dose is on Monday, you remember on Wednesday, take MTX on Wednesday and return to Monday schedule next week. Otherwise, skip the forgotten dose and continue with your regular dosing schedule. Do not take a double dose to make up for the missed dose.
- The doctor may prescribe a vitamin, folic acid, to prevent or decrease certain side effects. This should be taken on all days except the day of taking MTX.

What monitoring is required?

- Regular monitoring with liver function tests (LFT) and full blood counts (FBC) is required when on MTX.

- After several years of treatment with MTX, the doctor may order a special liver scan (Fibroscan) to look for liver fibrosis. If the scan is abnormal, a liver biopsy may be required to further diagnose this complication.

What are the possible side effects?

- Side effects of MTX include tiredness, nausea, vomiting, diarrhoea and mouth ulcers. Rarely, hair loss and rashes may also occur.
- MTX can affect liver and bone marrow function. These are monitored regularly during treatment with blood tests.
- If painful red rashes or severe mouth ulcers develop while on MTX, please stop medication and seek immediate medical attention.
- If taken for a long duration, there is an increased risk of certain cancers such as skin cancer and lymphomas.

Can I take other medications at the same time?

- Some drugs can interact with MTX, which can be dangerous. Do inform all doctors and medical professionals that you or your child is taking MTX. Do not take over-the-counter drugs or dietary supplements without discussing first with your doctor or pharmacist.
- Special care is needed with non-steroidal anti-inflammatory drugs (NSAIDs), such as aspirin and ibuprofen. Antibiotics containing trimethoprim must always be avoided.
- Alcohol may interact with MTX and increase the risk of liver toxicity. It should be avoided if possible or kept to minimum as suggested by your doctor.
- Do not take 'over-the-counter' herbal or vitamin preparations without discussing this first with your doctor, nurse or pharmacist.

Methotrexate and pregnancy

- Taking MTX during pregnancy will lead to deformities in the unborn baby.
- Before taking MTX, the doctor will do a pregnancy test for all women of child-bearing age.
- Both men and women of childbearing age must use a reliable method of contraception to avoid the risk of an unplanned pregnancy. Strict contraception should continue for at least six months after stopping MTX for patients trying to conceive. Please inform your doctor if you are trying to conceive.
- If you suspect that you are pregnant while on MTX, please consult the doctor immediately.

Useful telephone number

Central Appointments

6294-4050



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