

Cyclosporine

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**Common questions patients
with myasthenia gravis
ask about cyclosporine.**

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MYASTHENIA GRAVIS
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What is cyclosporine?

Cyclosporine is an immunosuppressive medication that is sometimes prescribed for individuals with autoimmune myasthenia gravis (MG).

It is manufactured as a capsule or an oral solution. You can purchase cyclosporine in generic form or by the brand names Gengraf®, Neoral®, Sandimmune®, SangCya®, Restasis®, or Pulminiq®. This drug is also available as a solution for injection.

How does cyclosporine work?

Cyclosporine suppresses the autoimmune response that is responsible for causing the fluctuating and fatigable muscle weakness of MG.

How soon should I see a response?

Some MG patients taking cyclosporine may notice a gradual improvement in their symptoms after a period of 2-3 months. Others may take longer to see a response.

How is cyclosporine taken?

Cyclosporine must be taken exactly as directed by the doctor. Never increase, decrease, or stop taking it without checking with your doctor. It is taken in divided doses 12 hours apart. Swallow capsules whole. Do not break or chew them. Take just after eating to diminish any stomach upset. You may take cyclosporine with milk or fruit juices, but not grapefruit juice, which may increase its effects. Mix the liquid form in a glass container and add a small amount of milk or juice to the glass. Drink it and make certain that you get all of the medicine.

It is important that all of your health care providers know you are taking cyclosporine because it can interact with many other medicines, causing undesirable effects. Even some over the counter drugs and natural remedies (such as St. John's Wort) should be avoided unless your doctor approves them.

The list below will help you and your physician know which medications may produce problems while you are taking cyclosporine.

Drugs that may cause kidney damage when combined with cyclosporine

- Antibiotics – gentamicin, tobramycin, vancomycin, trimethoprim/sulfamethoxazole (Bactrim®, Septra®), ciprofloxacin (Cipro®)
- Antifungals – amphotericin B (Fungizone®), ketoconazole (Nizoral®)
- Antivirals – acyclovir (Zovirax®)
- Antiulcer – cimetidine (Tagamet®), ranitidine (Zantac®)
- Nonsteroidals (NSAIDS) – ibuprofen (Advil®, Motrin®, Nuprin®), diclofenac (Voltaren®), piroxicam (Feldene®), indomethacin (Indocin®)
- Chemotherapy – melphalan (Alkeran®), etoposide (VePesid®)
- Cardiac/Blood Pressure – captopril (Capoten®), acetazolamide (Diamox®), furosemide (Lasix®), disopyramide (Norpace®)

Drugs that may raise blood cyclosporine levels

- Antibiotics – erythromycin
- Antifungals – ketoconazole (Nizoral®), difluconazole (Diflucan®), itraconazole (Sporanox®)
- Stomach/Ulcer – metoclopramide (Reglan®), cimetidine (Tagamet®)
- Cardiac/Blood Pressure – diltiazem (Cardiazem®), Dilacor XR®, nicardipine (Cardene®), verapamil (Calan®, Isoptin®, Verelan®)
- Hormones – danazol (Danocrine®), oral contraceptives, methylprednisolone (Medrol®)
- Miscellaneous – bromocriptine (Parlodel®)

Drugs that may decrease cyclosporine levels

- Antibiotics – rifampin (Rifadin®, Rifamatev), imipenem/cilastatin (Primaxin®), nafcillin (Unipen®), trimethoprim/sulfamethoxazole (Bactrim®, Septra®)
- Anticonvulsants – phenytoin (Dilantin®), Phenobarbital, carbamazepine (Tegretol®)

Drugs that may accumulate in the blood when taken with cyclosporine

- Steroids – prednisolone (Medrol®)
- Cardiac – digoxin (Lanoxin®)

Other reactions that may occur

- Cholesterol – lovastatin (Mevacor®) may cause muscle damage
- Cardiac/Blood Pressure – ACE inhibitors (Accupril®, Altace®, Capoten®, Lotensin®, Monopril®, Prinivil®, Vasotec®, Zestril®) may cause increased serum potassium

What may interact with this medicine?

Do not take cyclosporine with any of the following medications:

- bosentan
- cidofovir
- cisapride
- mibefradil

- ranolazine
- red yeast rice, monascus purpureus
- St. John's wort
- tacrolimus

Cyclosporine may also interact with the following medications:

- allopurinol
- amiloride
- amiodarone
- bromocriptine
- carbamazepine
- colchicine
- danazol
- imatinib
- medicines for fungal infections like fluconazole and terbinafine
- medicines for blood pressure like enalapril, ramipril, and losartan
- medicines for cholesterol like simvastatin, atorvastatin, and fenofibrate
- medicines for HIV infection like indinavir, nelfinavir, ritonavir, and saquinavir
- medicines that suppress the immune system
- melphalan
- methotrexate
- metoclopramide
- octreotide
- orlistat
- oxcarbazepine
- sirolimus
- spironolactone
- steroid medicines like prednisone or cortisone
- sulfapyrazone
- ticlopidine
- triamterene
- vaccines
- voriconazole

Side effects that you should report to your doctor or health care professional as soon as possible:

- Allergic reactions like skin rash, itching or hives, swelling of the face, lips, or tongue
- Changes in vision
- High blood pressure
- Increased urge to urinate or frequent urination
- Numbness or tingling in the hands and feet
- Seizures
- Severe stomach pain
- Vomiting
- Yellowing of the skin or the whites of the eyes

What will my doctor want to know before prescribing cyclosporine?

Since cyclosporine is a strong medicine, the doctor and patient must consider its risks and benefits. Your doctor will ask you about:

- Current medications and treatments.
- History of any allergies.
- History of high blood pressure.
- History of liver or kidney disease.
- History of diabetes or gout.
- Any recent infections or immunizations.
- Pregnancy, planning a pregnancy or breastfeeding.

What are some special considerations when taking cyclosporine?

The physician will check blood tests regularly to monitor for significant changes. BUN and serum creatinine are checked before beginning cyclosporine, then approximately once a month for 3 months, and then every 3 months. Cyclosporine blood levels are performed one month after starting, periodically thereafter, especially after a change in dose. Blood levels, called trough levels, are drawn 12 hours after the last dose, preferably before the morning dose.

Cyclosporine may cause unwanted side effects, some of which may be serious. Others may go away as your body adjusts to the drug. It is important to notify your health care providers about side effects. Allergic reactions can be life threatening and you should get emergency help at once. These include hives, severe itching, tightness in the neck or chest, trouble breathing, or swelling of the lips, tongue or throat. Also serious, are fever, chills, blood in the urine, and seizures. Careful dental hygiene is important because cyclosporine may cause gum swelling or bleeding. Other, more common side effects may include acne, increased hair growth, headache, nausea and vomiting.

The MGFA mission is to facilitate the timely diagnosis and optimal care of individuals affected by myasthenia gravis and closely related disorders and to improve their lives through programs of patient services, public information, medical research, professional education, advocacy and patient care.

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