

## What is azathioprine?

Azathioprine is an immunosuppressive medication that decreases the actions of the body's immune system. Drugs that suppress the immune system are used in people with myasthenia gravis (MG) because MG is an autoimmune disorder that results from production of abnormal antibodies. Azathioprine has been used as a treatment for MG since 1967. Azathioprine is available in a generic formulation or as the brand name Imuran®.

## How does azathioprine work?

Under normal circumstances, the immune system produces antibodies that protect your body against infection from invading bacteria and viruses. In autoimmune MG, the immune system produces several antibodies, the most common class of antibodies target the acetylcholine receptor (AChR). These are called: "AChR-antibodies." The AChR-antibodies block neuromuscular transmission and lead to muscle weakness. Azathioprine suppresses the immune system and reduces the production of antibodies. This allows the neuromuscular transmission to function normally, resulting in a return of muscle strength.

The efficacy of azathioprine is not immediately apparent—and your doctor may ask you to be patient and stick with the protocol even though you are not seeing results right away. It may take 3-12 months to know if the drug is working for you. If it is, you will see gradual improvement in muscle strength and decrease in severity



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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## AZATHIOPRINE (IMURAN®)

Answers to questions  
you may have  
about azathioprine



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of symptoms. This improvement may decrease the need for other MG treatments, most particularly as the corticosteroid class of medications, including prednisone. The maximum clinical improvement may occur during the first two years of therapy.

### What are some special considerations when taking azathioprine?

In using azathioprine, your doctor and you must consider its risks and benefits. Your doctor will want to perform a physical examination and gather a complete medical history and learn about any chronic or serious medical conditions and any medications that you have been taking, especially allopurinol (Zyloprim®), ACE inhibitors such as Lotensin®, Zestril® or Altace®, and the blood thinner Coumadin®. Other medications may interact with azathioprine and you should always discuss any prescription or over the counter drugs used with your physician and pharmacist. The normal metabolism of azathioprine requires the presence of an enzyme thiopurine methyltransferase (TPMT). A portion of the population has reduced or absent TPMT activity and therefore do not process azathioprine properly. Prior to the initiation of azathioprine activity, a blood test for TPMT activities should be performed to avoid toxicity.

Before taking azathioprine, you should tell the doctor if you have had an unusual or allergic reaction to this medicine previously. The doctor will want to know if you have any disease of the liver or pancreas. Azathioprine may cause skin rashes, fever and flu-like symptoms and it is imperative for you to notify your doctor when such

symptoms occur. Azathioprine may cause bone marrow suppression (resulting in anemia/low white blood cell and platelet counts) and liver damage (elevation of liver enzymes). Therefore, your doctor will check blood tests regularly to monitor for significant changes. In general, blood tests are done more frequently at the beginning of azathioprine therapy and gradually become less frequent. Ask your physician to discuss other possible, infrequent or theoretical complications, such as certain types of malignancies.

### How should azathioprine be taken?

It is important to take azathioprine exactly as directed by your doctor. Never increase, decrease or stop taking azathioprine without checking with the physician. Patients with MG may have to stay on this medication indefinitely – it is a long-term treatment.

The dosage of azathioprine is weight-based and varies from 100 mg. to 300 mg. per day. If you miss a dose while on a once daily schedule, skip the dose that was missed and return to the regular schedule with the next dose. Do not take a double dose. If you miss a dose while on a several times a day dosing schedule, take the missed dose as soon as it is remembered. If it is time for the next dose, take both doses together, and then resume the normal schedule. If more than one dose is missed, check with your prescribing physician for instructions.

To prevent or lessen stomach upset, try eating small meals frequently throughout the day and avoid fried or fatty foods. Dry

foods such as toast or crackers may help. Store azathioprine at room temperature away from heat, direct light or moisture.

While taking azathioprine, check with your prescribing physician about any immunizations and take precautions such as frequent hand washing and avoiding close contact with others with infectious diseases as you may be more vulnerable to contracting an infection. If you become ill with fever, chills or infection, contact your physician immediately. Always tell your physicians or dentist that you are taking azathioprine prior to having surgery or dental procedures.

### What are the possible adverse effects of taking azathioprine?

Azathioprine is generally tolerated very well without serious adverse effects. Most side effects may go away as your body adjusts to the medication. However, some possible adverse effects are very serious and need prompt attention.

Stop taking azathioprine and contact your doctor immediately if any of the following occurs: hives; swelling of face, lips, or tongue; or difficulty breathing; severe nausea and vomiting, diarrhea, fever or chills, loss of appetite, abdominal pain, skin rash (especially chicken pox or shingles), cough, cold sores in the mouth or on the lips, sore throat, blood in the urine or stool, unusual bruising, pale stools or darkened urine, yellowing of skin and eyes, darkening of the skin and fingernails, muscle or joint pain, hair loss, fatigue or a missed menstrual period.