

With Azathioprine there is a small increased risk of cancer of the lymphatic system (lymphoma) and of skin cancer linked to sun exposure. You should therefore avoid direct sunlight and use sun protection. Methotrexate may cause lung damage and therefore you will need to have a chest Xray.

Immunosuppressant's can cause foetal complications and Methotrexate can damage sperm cells. It is important to use oral contraceptive medicine.

Medications to avoid or use with caution

Always refer to your doctor before starting any new medications and inform your surgeon and anaesthetist before any surgery.

Aminoglycoside antibiotics (e.g. Gentamicin)	Botulinum toxin (botox)
Erythromycin/ampicillin/ciprofloxacin	Beta blockers e.g. Propanalol
Lithium	Lidocaine
Magnesium	Verapamil

Further Information

Myasthenia Gravis Association (<https://www.myaware.org/>)

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Please contact the Patient Advice and Liaison Service (PALS) if you require this leaflet in a different format, or would like to feedback your experience of the hospital. Telephone 01225 825656 or email ruh-tr.PatientAdviceandLiaisonService@nhs.net

Myasthenia Gravis

Information for patients

What is myasthenia gravis?

Myasthenia gravis (MG) is a disease caused by antibodies which cause muscles to become weak and fatigue easily. Normally, muscles are stimulated by a chemical called acetylcholine (ACh), which acts on Ach receptors on the surface of muscles. The antibodies in myasthenia gravis bind to these receptors and in the long term destroy the receptors leading to muscle weakness. Sometimes these antibodies are produced by an organ called the thymus gland which is either enlarged or cancerous. On occasion other antibodies called anti-MUSK antibodies may also cause MG.

Once diagnosed you should carry an alert card in case of emergencies and also inform the DVLA of the diagnosis.

What are the symptoms?

The main symptom is weakness of muscles that becomes worse with activity and improves with rest; with symptoms normally more noticeable towards the end of the day and after exercise. Severity varies between individuals.

Myasthenia gravis may affect the muscles around the eyes (ocular myasthenia) leading to droopy eyelids and double vision. When other muscles are also affected (generalised myasthenia) other symptoms may also develop. These include difficulty swallowing and chewing, slurring of speech, limb weakness, head drop and difficulty with breathing.

How is it diagnosed?

Normally the symptoms of muscle weakness you describe to the doctor are very typical but your doctor may also examine you for muscle weakness to support the diagnosis. Myasthenia gravis is usually confirmed by a blood test looking for the antibodies; however these antibodies are not detectable in all cases. Electrical studies of the muscles (EMG) can also be helpful to demonstrate characteristic abnormalities. A CT scan of the chest to look at the thymus gland is normally done at diagnosis and may be repeated after 5 years.

How is it treated?

Immediate treatment aims to increase the amount of acetylcholine available to stimulate muscles and to overcome the action of the antibodies. This is done with a drug called **Pyridostigmine** which prevents the breakdown of acetylcholine and needs to be taken 4-5 times a day.

Other drugs work by suppressing the immune system and thereby reducing production of abnormal antibodies. These include **steroids** (usually short-term due to side effects) and **Azathioprine/Methotrexate/Mycophenolate** (long term).

In severe cases, treatment may include infusion of Immunoglobulins (blood product) or Plasma Exchange which cleans the blood of antibodies.

Sometimes surgical treatment to remove the thymus gland may be necessary

What are the possible side effects of treatment?

Pyridostigmine can cause nausea, vomiting and stomach cramps/diarrhoea. Your Neurologist may prescribe Propantheline to counteract these side effects.

Steroids can thin the bones (osteoporosis) and your doctor will prescribe vitamin D, calcium and bisphosphonates to strengthen your bones. You should avoid smoking and drinking excessive alcohol. Steroids can irritate the stomach lining and therefore you will likely be prescribed something to protect your stomach lining (PPI). Long-term they can increase your risk of high blood pressure, cause weight gain diabetes and so these things should be monitored by your GP.

Immunosuppressants like Azathioprine and Methotrexate can affect the kidneys, liver and bone marrow. Regular blood tests are required before and during treatment. You and your GP will be provided a Shared Care Guideline with monitoring guidelines and symptoms and signs to look out for. There is also an increased risk of infections and therefore in addition to seasonal flu vaccinations, a 5 yearly pneumococcal vaccination is recommended. However due to the immunosuppressant affect live vaccines should be avoided including BCG, Varicella, MMR and polio.