



# Myasthenia gravis

## Overview

Myasthenia gravis (my-us-THEE-nee-uh GRAY-vis) is characterized by weakness and rapid fatigue of any of the muscles under your voluntary control. It's caused by a breakdown in the normal communication between nerves and muscles.

There's no cure for myasthenia gravis, but treatment can help relieve signs and symptoms, such as weakness of arm or leg muscles, double vision, drooping eyelids, and difficulties with speech, chewing, swallowing and breathing.

Though this disease can affect people of any age, it's more common in women younger than 40 and in men older than 60.

## Symptoms

Muscle weakness caused by myasthenia gravis worsens as the affected muscle is used. Because symptoms usually improve with rest, muscle weakness can come and go. However, the symptoms tend to progress over time, usually reaching their worst within a few years after the onset of the disease.

Although myasthenia gravis can affect any of the muscles that you control voluntarily, certain muscle groups are more commonly affected than others.

### Eye muscles

In more than half of people who develop myasthenia gravis, their first signs and symptoms involve eye problems, such as:

- Drooping of one or both eyelids (ptosis)
- Double vision (diplopia), which may be horizontal or vertical, and improves or resolves when one eye is closed

### Face and throat muscles

In about 15% of people with myasthenia gravis, the first symptoms involve face and throat muscles, which can:

- **Impair speaking.** Your speech might sound soft or nasal, depending on which muscles have been affected.
- **Cause difficulty swallowing.** You might choke easily, making it difficult to eat, drink or take pills. In some cases, liquids you're trying to swallow come out your nose.
- **Affect chewing.** The muscles used for chewing might wear out halfway through a meal, particularly if you've been eating something hard to chew, such as steak.
- **Change facial expressions.** For example, your smile might look like a snarl.

## Neck and limb muscles

Myasthenia gravis can also cause weakness in your neck, arms and legs. Weakness in your legs can affect how you walk. Weak neck muscles make it hard to hold up your head.

## When to see a doctor

Talk to your doctor if you have difficulty:

- Breathing
- Seeing
- Swallowing
- Chewing
- Walking
- Using your arms or hands
- Holding up your head

## Causes

### Antibodies

Your nerves communicate with your muscles by releasing chemicals (neurotransmitters) that fit precisely into receptor sites on the muscle cells at the nerve-muscular junction.

In myasthenia gravis, your immune system produces antibodies that block or destroy many of your muscles' receptor sites for a neurotransmitter called acetylcholine (as-uh-teel-KOH-leen). With fewer receptor sites available, your muscles receive fewer nerve signals, resulting in weakness.

Antibodies can also block the function of a protein called a muscle-specific receptor tyrosine kinase (TIE-roh-seen KIE-nays). This protein is involved in forming the nerve-muscular junction. Antibodies that block this protein can lead to myasthenia gravis.

### Thymus gland

The thymus gland is a part of your immune system situated in the upper chest beneath your breastbone. Researchers believe the thymus gland triggers or maintains the production of the antibodies that block acetylcholine.

Large in infancy, the thymus gland is small in healthy adults. In some adults with myasthenia gravis, however, the thymus gland is abnormally large. Some people with myasthenia gravis also have tumors of the thymus gland (thymomas). Usually, thymomas aren't cancerous (malignant), but they can become cancerous.

## Other causes

Some people have myasthenia gravis that isn't caused by antibodies blocking acetylcholine or the muscle-specific receptor tyrosine kinase. This type of myasthenia gravis is called antibody-negative myasthenia gravis. Antibodies against another protein, called lipoprotein-related protein 4, can play a part in the development of this condition.

Rarely, mothers with myasthenia gravis have children who are born with myasthenia gravis (neonatal myasthenia gravis). If treated promptly, children generally recover within two months after birth.

Some children are born with a rare, hereditary form of myasthenia, called congenital myasthenic syndrome.

## Factors that can worsen myasthenia gravis

- Fatigue
- Illness
- Stress
- Some medications — such as beta blockers, quinidine gluconate, quinidine sulfate, quinine, phenytoin, certain anesthetics and some antibiotics
- Pregnancy
- Menstrual periods

## Complications

Complications of myasthenia gravis are treatable, but some can be life-threatening.

### Myasthenic crisis

Myasthenic crisis is a life-threatening condition that occurs when the muscles that control breathing become too weak to do their jobs. Emergency treatment is needed to provide mechanical assistance with breathing. Medications and blood-filtering therapies help people to again breathe on their own.

### Thymus gland tumors

Some people with myasthenia gravis have a tumor in their thymus gland, a gland under the breastbone that is involved with the immune system. Most of these tumors, called thymomas, aren't cancerous (malignant).

## Other disorders

People with myasthenia gravis are more likely to have the following conditions:

- **Underactive or overactive thyroid.** The thyroid gland, which is in the neck, secretes hormones that regulate your metabolism. If your thyroid is underactive, you might have difficulties dealing with cold, weight gain and other issues. An overactive thyroid can cause difficulties dealing with heat, weight loss and other issues.
- **Autoimmune conditions.** People with myasthenia gravis might be more likely to have autoimmune conditions, such as rheumatoid arthritis or lupus.

[By Mayo Clinic Staff](#)

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