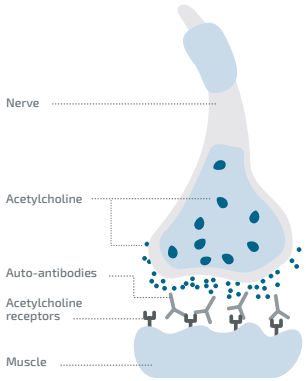
What is Myasthenia Gravis?

Myasthenia gravis (MG) is a rare, chronic neuromuscular autoimmune disease which causes debilitating and potentially life-threatening muscle weakness.[1-4]

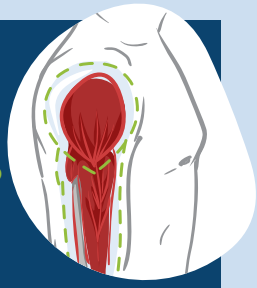
MG affects skeletal muscles, which control our ability to:[5]

speak | swallow | move our eyes | walk | brush our teeth | and even breathe.



Skeletal muscles contract when impulses from the brain travel down the nerves to activate muscle.[1] In MG, autoantibodies attack the junction where nerve meets the muscle, damaging the message the muscle is meant to receive. This leads to a muscle's failure to contract and causes weakness.[4]

DID YOU KNOW?



The name *"myasthenia gravis"* is Latin in origin, meaning "*grave muscle weakness*."[2]

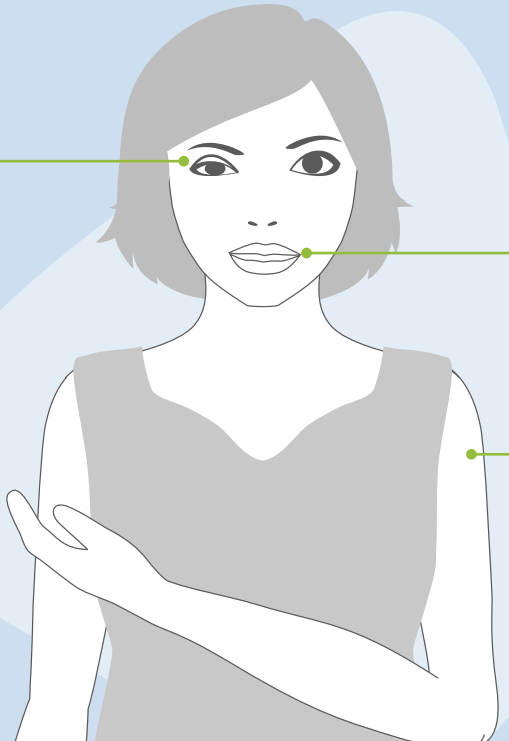
What are the signs or symptoms of MG?[1,6]

Patients refer to MG as the "snowflake disease" because each person's experience is unique. People with MG tend to experience increased muscle fatigue with repetitive use. Though MG can impact different muscles in each person, the most commonly affected muscles are those of the eyes and eyelids, face, and upper arms and legs. MG presentation can vary from patient to patient, day to day, or even throughout the same day.

The most commonly reported symptoms include:[1,6,7]

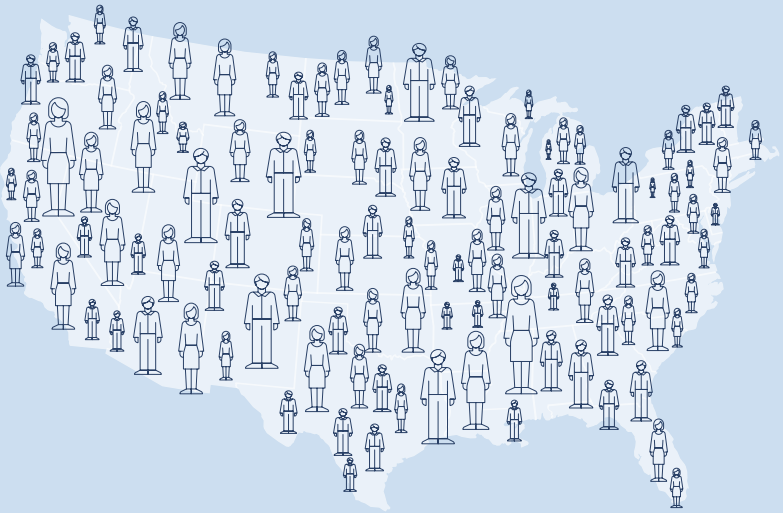
Eyelid drooping or **double-vision**

More than **50%** **of people with MG experience eye problems** as one of their first symptoms



Impaired speech (dysarthria) and **difficulty chewing or swallowing** (dysphagia)

Fatiguing weakness of arms or legs
Weakness that becomes progressively more severe throughout the day or after prolonged use of the muscles



60,000

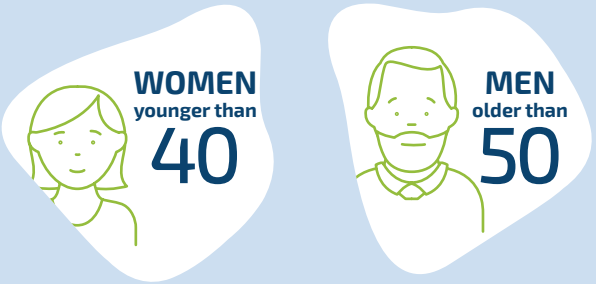
cases of MG in the U.S.

How common is MG?[1,3,6,8]

There are up to **60,000 cases of MG in the U.S.**, though many cases of MG go undiagnosed, and prevalence may be higher than numbers suggest. In comparison, multiple sclerosis, another autoimmune disease, has over 1 million cases in the U.S.[9] The prevalence of MG has increased in recent years, likely due to improved diagnostics, along with increasing frequency of autoimmune disorders globally.

Who typically gets MG?[1,6]

Though MG can occur at any age, it's more common in:



How is MG diagnosed?[2,10]

MG is typically diagnosed via several tests, including:

- **History of fatiguing weakness**
- **Physical or neurological examination,** which looks for increasing muscle weakness with repetition or prolonged exertion, such as increased eyelid drooping with prolonged up-gaze
- **Ice Pack Challenge test** as additional physical examination in which a cold ice pack is placed over drooping eyelid and temporarily restores function
- **Blood test** to look for the presence of autoantibodies, especially against the acetylcholine receptor (ACh R) or MuSK or LRP4 proteins on the muscle surface. However, some patients are considered seronegative, meaning no autoantibodies are detected
- **Electrodiagnostics test** to assess if repetitive nerve activation results in increasing muscle weakness in affected muscles – or other, more refined electrodiagnostic tests
- **Diagnostic imaging** of the thymus gland in the chest, which in patients with ACh R antibodies, may be overactive or have thymomas (tumors on the thymus gland)

What is the prognosis for people with MG?[1, 2, 7, 8]

There is no cure for MG, but treatment can control symptoms. Some people, especially after thymectomy, may recover from MG and no longer need treatment.[5] While the mortality rate associated with MG is low, life-threatening complications can arise from MG such as myasthenic crisis, which occurs when MG affects muscles that are necessary for breathing.

References

1 Myasthenia Gravis. National Organization for Rare Disorders. 2017. https://rarediseases.org/rare-diseases/myasthenia-gravis/. Accessed April 14, 2020. **2** Myasthenia Gravis Fact Sheet. National Institute of Neurological Disorders and Stroke. March 2020. NIH Publication No. 20-768. https://www.ninds.nih.gov/Disorders/Patient-Caregiver-Education/Fact-Sheets/Myasthenia-Gravis-Fact-Sheet. Accessed April 14, 2020. **3** Gilhus et al. Myasthenia Gravis. *Nature Reviews Disease Primers*. 2019. ID: (2019) 5:30 **4** Gilhus N. Myasthenia Gravis. *N Engl J Med*. 2016. 375:2570-81. DOI: 10.1056/NEJMra1602678 **5** Lumen. Muscular Tissue. Boundless Anatomy and Physiology. https://courses.lumenlearning.com/boundless-ap/chapter/muscular-tissue/. Accessed April 22, 2020. **6** Howard, J. Clinical Overview of MG. Myasthenia Gravis Foundation of America. 2015. https://myasthenia.org/For-Professionals/Clinical-Overview-of-MG. Accessed April 14, 2020. **7** Myasthenia Gravis. Mayo Clinic. 2019. https://www.mayoclinic.org/diseases-conditions/myasthenia-gravis/symptoms-causes/syc-20352036. Accessed April 14, 2020. **8.** MG Facts. Myasthenia Gravis Foundation of America. 2020. https://myasthenia.org/What-is-MG/MG-Facts#. Accessed April 14, 2020. **9.** National Multiple Sclerosis Society. How many people are living with MS? 2020. https://www.nationalmssociety.org/What-is-MS/How-Many-People. Accessed May 6, 2020. **10** Myasthenia Gravis. Mayo Clinic. 2019. https://www.mayoclinic.org/diseases-conditions/myasthenia-gravis/diagnosis-treatment/drc-20352040. Accessed May 12, 2020.