

# Myasthenia Gravis

## ABOUT THE DIAGNOSIS

Myasthenia gravis is a disease that decreases the function of muscle and causes premature muscle fatigue or even profound muscle weakness approaching paralysis. It is not a common disease, but it occurs much more often in dogs than cats.

The symptoms of myasthenia gravis include a weakness of all four legs (especially after exercise), with the classic appearance being of a dog that appears to tire very quickly even though the desire to continue is still there (total loss of strength). This is a weakness problem; there is no pain, and mental alertness is preserved. Passive regurgitation of food, muscle tremors, excess salivation, voice changes, dilated pupils, and coughing may be other symptoms observed as part of myasthenia gravis. These symptoms usually become more apparent and more severe over a period of time varying from days to months; however, in rare cases, symptoms have a very sudden onset. The dog or cat may not even be able to stand.

**CAUSE:** In most animals with myasthenia gravis, the disease is immune-mediated. This means that the body's immune system mistakenly perceives the body's normal muscle tissue as foreign and attacks it. With myasthenia gravis, the attack is at the level of the acetylcholine receptors, which are microscopic regions in each muscle fiber that are critical to muscle function. It is a case of mistaken identity: normally, the immune system recognizes intruders in the body that should not be there, such as bacteria and viruses, and produces antibodies to fight off these invaders. However, in animals with myasthenia gravis, the acetylcholine receptors on muscles are mistaken for foreign invaders by the immune system. Antibodies to the receptors are made, and the receptors are partially destroyed. In these dogs, symptoms can develop at any time but are often first noticed by owners when the dog is approximately 3 to 9 years old.

Rarely, puppies and kittens can be born with myasthenia gravis. In these animals, the immune system probably does not play a role in the disease, but rather they are born with defective muscle tissue (at the microscopic level) and while some may outgrow the problem, most puppies or kittens with myasthenia gravis at birth have a shortened lifespan as a result.

Myasthenia gravis can also be associated with or triggered by other diseases. If a dog or cat has one of these other diseases, they have an increased risk of developing myasthenia gravis. These diseases include some types of cancer, hypothyroidism, problems with the thymus (an organ in the chest), and others.

**DIAGNOSIS:** Myasthenia gravis is an uncommon disease. Therefore, if your veterinarian suspects that your dog or cat has myasthenia gravis, several tests may first be performed to eliminate the possibility of other diseases as more likely causes. Thoracic radiographs (chest x-rays) can be done to determine if your dog's esophagus is affected (megaesophagus) or if tumors are present in the chest, since both of these disorders occur in patients with myasthenia gravis. Rarely, certain heart problems can cause symptoms that are very similar to those of myasthenia gravis, and an electrocardiogram (ECG, EKG) and cardiac ultrasound (echocardiogram) can be performed to look for these abnormalities. A blood sample may be taken to look for indications of kidney, liver, or other problems.

The most reliable test for myasthenia gravis involves screening a blood sample for specific anti-muscle antibodies (acetylcholine receptor antibodies) made by the immune system. This requires sending the blood sample to a special laboratory, meaning the results may take several days to be available. Finding these antibodies (positive result) in patients with symptoms described above confirms the diagnosis of myasthenia gravis.

## LIVING WITH THE DIAGNOSIS

Dogs and cats with myasthenia gravis require special attention at home. Depending on the situation, you may need to give your pet with myasthenia gravis his/her medication every 8 hours or every 12 hours. The dosage and type of medication may need to be changed several times before the best combination is found. This often requires more than one visit to the veterinarian so the treatment can be adjusted properly.

Dogs and cats diagnosed with megaesophagus as part of myasthenia gravis have a greater chance of regurgitating food and developing aspiration pneumonitis, which is a potentially critical inhalation of food, water, and esophageal secretions into the lungs that occurs disproportionately more often in patients with megaesophagus. Aspiration pneumonitis can have very serious side effects and is the most common cause of death in dogs and cats with myasthenia gravis. Therefore, if your dog has megaesophagus as a component of myasthenia gravis, you should carefully monitor your pet during and after meals. For example, having megaesophagus means that food and water bowls should always be placed on an elevated surface, so that gravity can help with the passage of food and water down to the stomach (since the esophagus is hampered in its ability to do so). For more detail, ask for the companion Client Education Sheet titled "How to Provide Elevated Feedings."

In some dogs and cats, myasthenia gravis subsides after several months or years of treatment. Your veterinarian may recommend performing the test for antibodies (see above) periodically to monitor progress. However, animals born with myasthenia gravis generally do not go into remission. These pets do not generally respond favorably to treatment, and the symptoms worsen, often making for a poor long-term outlook (poor prognosis) in many cases in these young animals. It is important to differentiate this condition from juvenile megaesophagus, a similar situation where only the swallowing process is affected and where there is an opportunity for complete resolution (cure).

## TREATMENT

For dogs and cats with generalized weakness, exercise intolerance, and without megaesophagus, medication is available (such as pyridostigmine, brand name Mestinon) that can be given by mouth. Many animals respond well to this treatment and have a marked improvement or even complete resolution of their symptoms over time. Occasionally, cortisone-like drugs (corticosteroids) or other immune-suppressing medications are given in an attempt to reduce the body's immune-mediated attack on its own muscle tissue. If regurgitation is a problem, your veterinarian will discuss the best way to administer food and medication so that it is absorbed into the system.

If your pet aspirates regurgitated food into the lungs, vigorous treatment or, in the most serious cases, intensive care, may be

necessary to control pneumonia. These pets should be taken to the veterinarian or emergency clinic immediately if there is very labored breathing or respiratory distress. Antibiotics may be given to control bacterial infections, an intravenous (IV) catheter may be placed in a vein to give fluids for rehydration, and oxygen may be given to help such severely affected pets breathe more easily.

### DOs

- Give medication(s) exactly as directed.
- Keep food and water bowls on elevated platforms.
- Inform your veterinarian if your pet has ever been diagnosed with any medical condition or is currently taking medication.

### DON'Ts

- Do not allow your dog or cat to continue eating or drinking if coughing begins during a meal.
- Do not stop giving medication until you talk to your veterinarian or the veterinarian at the emergency clinic. Some medication(s) need(s) to be decreased gradually or serious side effects can result.

### WHEN TO CALL YOUR VETERINARIAN

- If you cannot keep a scheduled appointment.
- If the problems get worse, especially after giving medicine.
- If you are unable to give medicine as directed.
- If you see signs of not feeling well or of potential complications (see below).

### SIGNS TO WATCH FOR

- Adverse reactions to medication may include weakness, anxiety or nervousness, nausea, vomiting, diarrhea, salivation, difficulty breathing, or very rarely, seizures.
- Signs of complications or recurrence include loss of appetite, recurrent coughing (often moist or raspy), ongoing lethargy or sluggishness, persistent muscle weakness, and relapse of (or failure to eradicate) original symptoms.

### ROUTINE FOLLOW-UP

- Usually within 1 week after the initial diagnosis; then periodically as determined by response to treatment and presence or absence of complications. Animals with myasthenia gravis often have this condition for life, requiring periodic but lifelong medical follow-up.

Practice Stamp or Name & Address