

## **Treatment of Myasthenia Gravis**

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Myasthenia gravis (MG) is a fatiguing disease in both humans and animals. The resulting weak musculature in the esophagus causes MG patients to have difficulty swallowing solid dosage forms. Because MG patients have difficulty swallowing and are at increased risk for aspiration pneumonia, compounding pharmacists can positively contribute to therapeutic outcomes by providing liquid dosage forms that may minimize risks of esophageal erosion and aspiration. Dogs and cats suffering from MG, many of whom are fragile in condition and delicately controlled on medication, can greatly benefit from the services of a compounding pharmacist who understands the disease process and treatment objectives for MG in veterinary patients.

Hyperthyroid cats treated with methimazole may suffer from a reversible myasthenia gravis. Because many veterinary pharmacists are responsible for providing methimazole to cats, they realize the importance of recognizing this potential adverse effect.

Owners of MG patients commonly report vomiting, which actually may be regurgitation from weak esophageal musculature. Other owner-noted signs include voice change, exercise-related weakness with fatigue or cramping upon mild exercise, and history of acute collapse. Because of their close contact with clients, pharmacists may play an important role in referring pet owners to veterinarians when they recognize the possibility of the presence of MG based on the description of symptoms.

Veterinarian-pharmacist partnerships may often improve patient management in cases of MG patients needing either acute care or chronic care. Initial management of acute episodes requires inpatient stabilization, usually in the intensive care unit, and treatment with acetylcholinesterase inhibitors (pyridostigmine bromide). These drugs prolong the action of acetylcholine at the neuromuscular junction. While pyridostigmine bromide oral solution (Mestinon by Roche) is the most common drug and dosage form used for initial acute management, some formulas are available for compounded pyridostigmine solution, enabling dosing tailored for the patient. Because the oral absorption of pyridostigmine bromide is completely inhibited by methylcellulose, knowledgeable pharmacists know they must avoid suspending pyridostigmine in vehicles containing methylcellulose. Oral bioavailability in animals is, at best, only about 10 percent and reducing this availability by any amount has a very dramatic effect on therapeutic response. Once MG patients are controlled on a dosage form, reformulation of the dosage form is not advisable lest the patient come out of remission and suffer aspiration. Other drugs which may reduce the safety margin of pyridostigmine include aminoglycosides, antiarrhythmics, phenothiazines, anesthetics, narcotics, muscle relaxants and magnesium. Corticosteroids may also decrease the effect of pyridostigmine by initially worsening the disease when added to existing therapy.

The compounding pharmacist focusing on veterinary medications can, as previously mentioned, greatly assist the veterinarian in patient education. Pharmacists can join the veterinarian in offering tips which will reduce the risk of aspiration or choking, for example experimenting with food consistency to determine if the pet can best tolerate foods such as gruel, hard consistency or soft consistency. Clients may also be advised that elevation of food and water bowls will potentially decrease the risk of aspiration and regurgitation.

Knowing that Myasthenia Gravis is not curable but is treatable and that favorable outcomes--especially in the cases of acquired MG--can be achieved, veterinary pharmacists can assist and support veterinarians, their clients and patients to provide the extensive care needed to manage MG.