Myasthenia gravis

What is Myasthenia gravis and what are the causes?
Myasthenia gravis is a disease causing muscle weakness. It affects the area where nerves meet the muscles called the neuromuscular junction. Normally, nerve signals are passed on to the muscle with the help of small molecules (a chemical messenger called acetylcholine) crossing this junction and docking onto a specific receptor (acetylcholine receptor). This will trigger the contraction of the muscle. In Myasthenia Gravis there is abnormal transmission of the message between the nerves and the muscles which causes weakness.

Congenital Myasthenia gravis:animals born with myasthenia gravis are born with too few acetylcholine receptors and this disturbs the normal function of the neuromuscular junction. This has been described in Jack Russell terriers, Springer Spaniels and Smooth-haired Fox terriers.

Acquired Myasthenia gravis: this is the more common form of the disease and is considered to be an autoimmune disease. The body's immune system attacks and destroys the acetylcholine receptors. It is not known why the immune system suddenly decides to attack these receptors in some dogs. Rarely Myasthenia Gravis can be triggered by cancer, or can be associated with other immune diseases affecting the nerves or muscles, or be related to an under-active thyroid gland. It is seen most commonly in Akita Inus, Terrier breeds, German Shorthaired Pointers, German Shepherd dogs and Golden retrievers, Abyssinians and Somali cats.

What are the signs of Myasthenia gravis?
Depending on which muscles of the body will be affected the clinical signs can vary from exercise intolerance (the animal seems normal for the first seconds or minutes and progressively gets weaker and will need to sit down being unable to get up for a couple of seconds to minutes), to complete inability to stand or walk to inability to swallow or keep food down (due to a problem with the food pipe).

How is Myasthenia gravis diagnosed?
The investigations vary depending on the subtype of Myasthenia gravis. In most cases the best test to diagnose acquired MG in is a blood test which looks for antibodies directed toward the acetylcholine receptor. Sometimes another test needs to be performed where a drug is given which quickly (but only shortly) reverses the weakness if it is caused by MG. Electrodiagnostic studies can be very useful in ruling out other neuromuscular diseases that might cause similar signs. In cases were a congenital form is suspected a muscle biopsy needs to be taken and sent away for analysis. If there is a suspicion that the MG was triggered by an underlying disease, like cancer, then other investigations may be required: chest X-Rays, abdominal ultrasound or a CT scan.

What treatment options are available?
Specific treatment tries to diminish the clinical signs by giving a medication to help with the transmission of the signal between the nerves and muscle. Depending on individual circumstances, it may be necessary to give drugs that will suppress the immune system to stop it attacking the receptors.

What is the prognosis?
In mild cases prognosis is generally good and a complete recovery can be achieved. Repeated blood tests to measure anti-AChR antibody levels will be required. In more severe cases (especially if the problems swallowing lead to severe pneumonia) the prognosis is quite guarded. The earlier the diagnosis is made and treatment is started the higher is the chance of a successful outcome. Some patients will go into remission over 6 months.