WHAT IS: Myosin-Heavy Chain Myopathy (MYHM)

MYHM is a genetic muscle disease that can result in two distinct clinical disease presentations that both involve muscle loss or damage and are linked to the same genetic variant. A horse with MYHM is prone to presenting with one or both during their lifetime, while some horses with the mutation may never experience symptoms.

MYHM is a relatively newly discovered genetic disorder. This mutation makes horses susceptible to disease. Horses with the mutation exposed to environmental triggers will develop symptoms of the disease. Not all environmental risk factors are currently known. Therefore, it is impossible to say if or how a horse with the MYHM mutation will be affected. This makes it important to have your horse tested, as management is key to preventing an episode.

Immune-Mediated Myositis (IMM) is one form of clinical disease caused by MYHM, this results in muscle atrophy that is suspected to be the result of a response to a vaccine or infectious agent such as strangles. The immune system misinterprets the muscle cells as foreign and rapidly attacks them. Horses initially experience stiffness, weakness, and a decreased appetite followed by the rapid loss of 40% of muscle mass within 72 hours.

The second presentation of MYHM is Nonexertional Rhabdomyolysis and often presents as stiffness, like "tying up", and possible swelling of muscles along the back and haunches without exercise.

Nonexertional rhabdomyolysis causes pain, muscle cramping, muscle damage and may or may not result in muscle loss. Horses affected by IMM or nonexertional rhabdomyolysis can recover but may have more frequent episodes.

MYHM is a dominant mutation, which means your horse only needs one copy to be affected, though not all horses with the mutation will become affected. They must be exposed to a trigger to experience symptoms. Horses that are homozygous (My/My) are likely to experience more severe symptoms.

Approximately 7% of quarter horses have the MYHM variant. It is most commonly found in reining horses, cowhorses, and halter horses.

RESULTS:

N/N Results

Your horse did not inherit MYHM and is considered normal. They cannot pass the mutation on to offspring.

N/MY Results

Your horse did not inherit MYHM and is considered normal. They cannot pass the mutation on to offspring.

MY/MY Results

Your horse inherited two copies of MYHM and is homozygous for the defect. Your horse will likely experience severe symptoms if/when triggered. If your horse experiences rapid muscle loss from IMM it will be more severe than a N/My horse and is less likely to recover from the muscle loss. Your horse will pass on MYHM to their offspring regardless of the other parent's MYHM status.

SYMPTOMS:

- Stiffness
- Extreme muscle pain
- Weakness
- Muscle tremors
- Lethargy
- Muscle swelling
- Rapid heartbeat and breathing
- Loss of appetite
- Difficulty getting up when laying down
- Dark urine
- Rapid muscle loss – 40% loss within a 48hr period

ENVIRONMENTAL TRIGGERS:

- Vaccinations - Specifically, influenza, rhinovirus, and strangles or other vaccinations that cause muscle inflammation
- Upper respiratory infections such as strangles
- Pigeon Fever exposure
- Muscle damage

HOW CAN I MANAGE MYHM?

Quality high protein diets are recommended with amino acids supplemented as needed. Additional protein may be supplemented after an episode to support muscle growth.
Avoid any form of strangles vaccine. Use intranasal vaccines when possible. Only use intramuscular vaccines when necessary.

Spacing individual vaccines out 4-6 weeks is recommended. (Strangles, Rhinovirus, Influenza vaccines are NOT recommended). Take care to quarantine any new horses for 14 days to avoid introducing an infectious agent to your barn. Responsible breeding can reduce the number of affected horses.

HOW CAN AN MYHM EPISODE BE TREATED?

Immune-mediated myositis (IMM) is one of the forms of MYHM. If IMM is triggered, contact your veterinarian immediately and begin steroid therapy. Improvement in appetite should occur within 48 hours of steroid therapy. Muscle atrophy should stop, and muscle mass should return within 2-3 months.

Though, some muscles may have a permanent indentation. Without steroids, muscles atrophy will still eventually stop, but the return of muscle mass may take a longer period of time. IMM usually resolves without long term consequences in horses with one copy of MYHM. Homozygous horses are likely to develop more severe atrophy and are less likely to recover.

Horses recovering from IMM should be fed a concentrate with high-quality protein balanced for vitamins and minerals. Alfalfa hay and amino acid supplements may provide building blocks for muscle developments.

For horses with nonexertional rhabdomyolysis, treatment often consists of flushing infected guttural pouches and giving antibiotics. Corticosteroids may be prescribed. Treatment with dantrolene may be administered. Nonexertional rhabdomyolysis is more rare than IMM, but often more severe.