

# HORSE HEALTH

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## Tying Up Syndrome

Tying-up syndrome, or rhabdomyolysis, is a myopathy (disorder affecting the body's muscle system) that decreases the performance — and therefore, the use — of an affected horse. Researchers classify rhabdomyolysis disorders according to their relationship to exercise as exertional and nonexertional as well as to their specific cause (etiology).

The following information, provided by Dr. Katharina Lohmann of the Western College of Veterinary Medicine's Department of Large Animal Clinical Sciences, focuses on exertional rhabdomyolyses — disorders that typically occur in horses performing exercise beyond their conditioning status or horses performing strenuous exercise after a period of rest and inactivity.

“Tying-up” syndrome, also known as *rhabdomyolysis*, refers to the particular *myopathies* (disorders affecting the body's muscle system) that cause muscle-cell destruction. Common symptoms include painful muscle cramping and hardening as well as severe increases in muscle enzymes that can be detected through laboratory testing.

Researchers classify these disorders in relation to exercise, categorizing them as exertional and nonexertional. Exertional rhabdomyolysis may be sporadic or can be a chronic recurrence in some affected horses.

### **Sporadic exertional rhabdomyolysis**

The sporadic type of exertional rhabdomyolysis occurs in horses performing exercise beyond their conditioning status and in horses performing strenuous exercise after a period of rest and inactivity.

- **Clinical signs:** The signs, which can appear very quickly, include a reluctance to move and/or a stiff gait, firm and painful muscles, weakness and fatigue, and signs of anxiety such as sweating, rapid heartbeat and rapid breathing. Some affected horses may also pass dark urine, and in severe cases, affected horses may go down (become recumbent).

- **Risk factors:** Inadequate conditioning, high carbohydrate intake, deficiency in vitamin E and/or selenium, hypothyroidism, and bacterial or viral infections are some of the risk factors that veterinary researchers have considered. However, the evidence supporting these factors is still unclear. Since female horses seem to be predisposed, hormones may be a factor. Differential diagnoses of lameness, colic, pneumonia, back pain or neurological diseases can be ruled out by a complete physical examination and with laboratory tests of blood and urine.

- **Treatment:** Treatment includes rest, intravenous and/or oral fluid therapy, *non-steroidal anti-inflammatory drugs* (NSAIDs) for pain control and, if necessary, sedatives to control anxiety. If deficiencies in vitamin E and selenium are identified, supplements should be provided. In the acute stages of the disease, horses shouldn't be forced to move, and their return to exercise should be based on improved lab results as well as their willingness to move.

Recumbent horses should have soft bedding to prevent injury, and their caregivers should encourage them to stand and turn every few hours to avoid bedsores. If a horse is unable to stand, the animal should be turned every few hours. In some cases, it may be necessary to use a sling to help an affected horse stay

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# Tying Up Syndrome *(continued)*

upright; however, horses that are in pain should not be forced to stand for extended periods of time.

- **Prognosis:** The prognosis for recovery is generally favourable as long as the animal is treated early enough and doesn't develop complications such as kidney failure. The recovery time depends on the severity of the disease; an adequate rest period and gradual return to exercise are required. Proper conditioning and regular exercise — including pasture turn-out — are also recommended.

## Chronic recurrent rhabdomyolysis

This disease group causes recurring episodes of rhabdomyolysis. The severity and the intervals between episodes can vary greatly, and genetics may be an underlying factor.

To maintain their athletic capability, affected horses require careful lifelong management as well as changes in their diet and exercise regimen. Horses that are diagnosed with this condition may never be able to perform as racehorses or participate in other high-level performance events. On the other hand, they may do well in other less challenging occupations.

## Polysaccharide storage myopathy (PSSM)

PSSM is a common cause of chronic recurrent rhabdomyolysis in Quarter horses, Paints and Appaloosas as well as in warmblood breeds and draft horses. PSSM is caused by a genetic defect that's particularly common in PSSM-affected Quarter horses and draft-related breeds. As a result, veterinarians recommend genetic testing for some breeds.

- **Clinical signs:** Clinical indications of PSSM include repeated episodes of “tying up” with less than strenuous exercise, muscle stiffness during and after work, exercise intolerance, and, possibly, changes in behaviour.

- **Diagnosis:** The first step in diagnosing PSSM is ruling out other causes such as lameness through careful examination and laboratory tests. The next step is often exercise testing which may be followed up with further diagnostics such as muscle biopsy and genetic testing.

- **Treatment:** Veterinarians recommend mild exercise as soon as possible for horses diagnosed with PSSM. Other recommendations include making dietary changes, maintaining an ideal body weight and following a specific exercise regimen.

Dietary changes involve reducing carbohydrates and increasing fat as an energy source. While commercial diets are available, an alternative is to gradually add rice bran or vegetable oils to the horse's feed. High-performing horses may require additional calories in their diet.

Regular exercise is important; pasture turnout is ideal and stall rest should be limited as much as possible. Unless there's adequate preparation and conditioning, horse owners must avoid sudden changes to an affected horse's exercise regimen

— such as a long trail ride. As well, affected horses shouldn't take long trips in a trailer or be involved in other stressful events.

Owners who follow veterinarians' recommendations for diet and exercise are more likely to see a reduction in the frequency and severity of PSSM episodes in horses diagnosed with this condition.

## Recurrent exertional rhabdomyolysis (RER)

RER is a condition that presents similar symptoms to PSSM and is mainly diagnosed in Thoroughbred and Standardbred racehorses.

- **Risk factors:** Episodes of RER may be related to the stress of training and racing. Young horses — particularly fillies and horses with nervous dispositions — may be at a higher risk. Researchers have also identified high-grain rations and certain training strategies as possible risk factors for RER.

- **Diagnosis:** Like PSSM, exercise testing and a muscle biopsy are the most useful tools for diagnosing RER.

- **Treatment:** Managing RER is similar to PSSM in terms of diet and exercise. As well, it's essential to reduce stress in affected horses' lives. For example, owners should standardize the horses' daily routines. The animals should be exercised and fed before their barnmates, and low doses of anti-anxiety drugs may be given prior to exercise. Several drugs such as *dantrolene* (a muscle relaxant) and *phenytoin* (an anti-convulsant drug) may be helpful in preventing episodes of rhabdomyolysis in affected horses, but these medications should only be used under veterinary direction.

## Summary

Rhabdomyolysis remains an important cause of morbidity and mortality in horses. Recent advances in identifying underlying myopathies, some of which are now known to be genetically determined, have helped veterinary researchers gain a better understanding of this group of disorders and to develop more specific treatment and management recommendations.

To optimize management and to make important breeding decisions concerning affected horses, it's important for horse owners and their veterinarians to pursue thorough diagnostic testing of animals with rhabdomyolysis — especially if it's a recurring problem.

*Lohmann, Katharina L. “Equine Myopathies: An Update (Part 1)” Large Animal Veterinary Rounds 8(7), 1-6. Original article summarized by Lynne Gunville.*

*For more information about nonexertional rhabdomyolyses — such as hyperkalemic periodic paralysis (HYPP) — please visit [www.larounds.ca](http://www.larounds.ca) to read the December 2008 issue entitled, “Equine Myopathies — An Update (Part 2),” by Dr. Katharina Lohmann. H*