

A close-up, high-angle photograph of a horse's face, focusing on the eyes and nostrils. The horse's coat is light-colored, possibly white or grey, with a dark stripe running down the center of its forehead. The background is a soft, out-of-focus green, suggesting an outdoor setting. The lighting is bright, highlighting the texture of the horse's skin and the details of its facial features.

EASY BREATHING

Respiratory Ailments
May Keep Horses
From Top Performance

And Bronkhurst Photography



he athletic endeavors of horses are often beset by respiratory problems. Second only to musculoskeletal disease, respiratory compromise, when severe enough, can cut short the productive lives of horses.

Horse owners are often quick to lay blame on an “allergy” when a horse begins to cough or wheeze. An allergy is any hypersensitivity to a specific stimulus, even a stimulus that a horse has been previously exposed to without detriment. This hypersensitivity results in self-injury. The degree of debilitation caused by an allergy depends on the severity of the reaction and the number of body systems involved.

On the respiratory front, one of the most common allergies among middle-aged horses manifests itself as recurrent airway obstruction (RAO), a disease characterized by habitual cough and signs of respiratory distress that include flared nostrils, increased respiratory rate, and forced abdominal breathing. The horse may also appear anxious. RAO was once referred to as chronic obstructive pulmonary disease (COPD), but a human condition that shared that name has significantly different symptomatology, so RAO is now the preferred name among veterinarians. Around the barn, RAO is known commonly as heaves.

Most horses diagnosed with RAO are stabled a portion of the day, fed large amounts of hay, and reside in temperate climates. Horses that graze outdoors year-round rarely, if ever, are afflicted by RAO.

The first clinical signs of RAO are usually observed following exposure to organic substances from hay and bedding during routine stabling. These substances, called allergens because they provoke an allergic reaction, include commonplace barn molds, forage mites, and endotoxins. Once inhaled by the horse, many allergens are minute enough to travel through respiratory channels and settle into the smallest airways of the lungs. As dust and mold deposit in the lower airways, an inflammatory response is mounted, which may include an accumulation of mucus in the airways, thickening of the tissues due to edema, and narrowing of the airways (also called bronchospasm). These changes in respiratory function may become worse in the presence of other air pollutants such as ammonia.

Onset of breathing changes can occur as quickly as six to eight hours after being stabled. Brief exposure of an RAO-susceptible horse to stabling may induce hyperresponsiveness that lasts several days.

The concentration of these allergens in the breathing zone, the airspace around the muzzle, is a critical factor in the development of RAO in susceptible horses. Typical feeding behavior such as eating hay for long periods of time and shaking hay to extract tastier bits increases the concentration of dust in the breathing zone, thus intensifying the likelihood of RAO.

While horses inhale organic dusts present in straw and other bedding, hay is the major source of aeroallergens. Hay that is baled at 20 to 30% moisture results in heating and moderate mold contamination, and hay baled at higher moisture contents will contain heavy burdens of mold.

For the majority of RAO-affected horses, removal of hay (or other sources of offending allergens) from the diet will alleviate all signs of the disease. Recognition of summer pasture-associated obstructive pulmonary disease has occurred in Southern states. The cause of this hypersensitivity reaction is unknown, though some researchers believe the syndrome may be linked to the production of spring and summer pollen by flowering plants and trees.

The severity of the disease depends largely on the individual allergic reaction of the horse. In mild cases of RAO, horses may appear normal at rest but cough or have nasal discharge during exercise. Horses with more advanced RAO typically have several clinical signs at rest; these may include frequent coughing, nasal discharge, increased respiratory rate, and increased effort in breathing. Forced expiration may result in overdevelopment of some abdominal muscles, eventually forming a "heave line." These horses will most likely be unable to perform even light exercise because their respiratory apparatus is incapable of delivering sufficient oxygen to arterial blood flow, which results in rapid fatigue.

The appearance of clinical signs has much to do with how a horse is managed. As management changes, horses may become more prone to signs. For instance, a horse that is brought up daily to spend the hot hours out of the sun may have a sudden onset of clinical signs, as may a horse that is exposed to a new batch of hay. Clinical signs may worsen until management changes and treatment options are properly in place.

Diagnosis of RAO is typically based on history and clinical signs. Diagnostic testing can be performed on horses to ascertain the severity of the inflammation. Bronchoalveolar

lavage using fiberoptic endoscopy in horses was first reported in the early 1980s. Since initial attempts, bronchoalveolar lavage has become the veterinary standard for collection of respiratory secretions.

Recurrent airway obstruction is characterized by habitual cough and signs of respiratory distress that include flared nostrils, increased respiratory rate, and forced abdominal breathing.

Samples of bronchoalveolar fluid are siphoned from lower airways and evaluated microscopically. In normal horses, lymphocytes and macrophages form the majority of cells in the fluid, and neutrophils comprise less than ten percent of cells. In horses with RAO, there is an increase in the percentage of neutrophils, cells that signal inflammatory changes. Neutrophils may make up more than 50% of the cell population in severely affected horses. Though bronchoalveolar lavage is the most reliable measure of RAO severity, aspiration of tracheal mucus or tracheal lavage can also be used to evaluate lung inflammation.

No cure for RAO is known. However, shrewd management and treatment measures usually result in marked clinical improvement and minimize recurrent episodes. Environmental control is the most critical management issue. By reducing exposure to aeroallergens and other pollutants, airway inflammation can be attenuated.

Another important component of a management plan would be complete removal of the horse from the stable. Not only do horses that live the majority of their lives outside have little problem with RAO, but afflicted horses returned to all-day turnout typically recover from a bout of RAO in a matter of days.

Because horses are so often used for competitive riding, complete turnout may not be an option. In such cases, dry hay must be eliminated entirely from the diet. In mild cases, soaking the hay prior to feeding may be effective in reducing dust levels. Sprinkling the hay with water from a hose is not sufficient; hay must be drenched. One method is to place the hay into a clean and empty muck bucket and to fill the bucket with water, making sure all hay is submerged. The hay should then sit for 10 to 15 minutes, and should not be



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immersed in water any longer than 30 minutes prior to feeding, as water-soluble nutrients may be leached from the hay. Horses should be offered hay immediately following removal from the water.

Soaking hay daily is a labor-intensive chore. Alternative forage sources such as hay cubes, haylage, or completely pelleted feeds may be used instead of wet long-stem hay. These alternative forages may be dietary staples for horses with severe RAO. Horses must still be offered a small amount of long-stemmed roughage but this requirement may be met if pasture is provided for several hours of the day.

An evaluation of the horse's stable environment may also be in order. Though bedding finishes a distant second to hay in terms of causing and perpetuating RAO, it may have an effect on the severity of the disease. Straw should be completely avoided when selecting bedding for a RAO-affected horse. Shredded paper, wood shavings, and peat moss, used in conjunction with rubber mats, are the healthiest alternatives to straw. Some owners of affected horses feel that bedding adjacent stalls with the same material may also reduce incidence and severity of attacks.

During stall cleaning and rebedding, horses with RAO should be removed from the immediate vicinity. The horse should also not be present during long-term handling of hay, such as unloading hay into the barn. Horses with RAO should not be stabled in areas where hay is stored overhead, because dust and mold can descend from the loft into the stall.

Though environmental management may effectively control mild RAO, veterinary intervention is warranted in more severe cases. Treatment will often include the combined use of bronchodilators and corticosteroids. Duration of pharmacological therapy varies with individual cases. A bronchodilating agent may be necessary for a horse suffering a "heaves attack," while a long-term course of corticosteroids may be prudent to control airway inflammation of horses with pronounced RAO.

Inflammatory Airway Disease

Inflammatory airway disease (IAD) is a coinage used among horsemen, particularly racetrack veterinarians, that refers to a mild variant of RAO. While RAO rarely affects horses under seven years old, IAD is predominantly diagnosed in young horses, those under five years of age. Though IAD can occur in any breed, estimates of the prevalence of IAD among young Thoroughbred and Standardbred racehorses range from 11 to 50%.

Several risk factors are thought to set the stage for lower airway inflammation in young equine athletes. Risk factors include long-distance transport, intermingling with other horses, high-intensity exercise (such as racing),

exercise-induced pulmonary hemorrhage (EIPH or bleeding), and housing in a stable.

A hard-and-fast cause of the disease is not known. Researchers believe, however, that the etiology may be multifactorial and include bacteria, viruses, and inhaled environmental pollutants.

Clinical signs include low-grade airway obstruction characterized by cough and mild accumulation of pus within the airways. Unlike horses with RAO, IAD-afflicted horses experience a mild intolerance to exercise. The impairment, however, should not be downplayed, as it is usually sufficient to hinder performance of top-drawer athletes.


Another factor that sets IAD apart from RAO is duration of disease. As mentioned earlier, RAO is a chronic, lifelong syndrome. IAD, on the other hand, may last several weeks but recurrence is unlikely.

No cure for RAO is known. However, shrewd management and treatment measures usually result in marked clinical improvement and minimize recurrent episodes. Environmental control is the most critical management issue.

Similar to RAO, diagnosis of IAD is usually based on bronchoalveolar lavage. Other diagnostic techniques, including tracheal aspirate (also called tracheobronchial aspiration or tracheal wash), thoracic radiography, hematology, and serum biochemical examinations, have yielded little useful information.

Horses suspected of having IAD should be under the care of a veterinarian. Treatment is likely to be centered on the use of medications such as corticosteroids and bronchodilators. Evaluation of the environment may also be in order. Reducing environmental stressors (such as high-dust bedding and forages) and maximizing ventilation are two ways to help resolve IAD.

It is understandably difficult to enforce these guidelines in some settings. With their closed, airtight barns and lack of turnout, racetracks sometimes offer an unforgiving atmosphere for horses with IAD. In instances of severe illness, racehorses may have to leave the track for some downtime on the farm.

Because of the relative newness of IAD on the disease front, definitive knowledge is scant. As time passes and researchers begin to identify the causes of IAD in young horses, veterinarians will be better able to treat the disease, and horsemen will be one step closer to maintaining healthy equine athletes. 



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