



Respiratory Diseases in Horses: What You Can Do to Prevent Them

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Respiratory diseases can be costly for the horse owner/manager in many ways. Some respiratory diseases may cause abortion, and the expense of veterinary care associated with respiratory disease can be significant. Early detection of respiratory disease is important for successful treatment and to minimize days lost in training, racing, showing or poor performance, which often is the greatest cost.

Developing a management plan to minimize the risks of respiratory disease as well as to facilitate early recognition of these diseases requires a good general understanding of these diseases. It is important to understand that with current knowledge and available prophylactic procedures, it is impossible to completely eliminate respiratory diseases from our horses. Instead, we should endeavor to decrease the incidence and severity of these diseases, thereby decreasing the associated costs.

The major categories of respiratory diseases affecting horses are infectious (those caused by viruses or bacteria), allergic and parasitic. This article will focus on the infectious causes of respiratory disease. Although for this discussion we will consider these diseases individually, be aware that in individual animals more than one disease may be present, and one organism may produce respiratory tract damage that paves the way for another organism to cause a more serious condition.

Viral Respiratory Disease

The most important viral respiratory diseases affecting horses are equine herpes virus, equine influenza, equine viral arteritis, and rhinovirus. Equine herpes virus and influenza probably cause the majority of viral respiratory diseases seen in our area. However the incidence of rhinovirus infection is unknown.

Equine Herpesvirus (EHV)

Equine herpesvirus is one of the most common respiratory diseases affecting horses. There are five types of equine herpesvirus (EHV). Types one and four are the most common, however two has been recently associated with respiratory disease in the horse. Equine herpesvirus infections can cause respiratory disease, neurologic disease and abortion. Clinical signs of the respiratory form of EHV1 and 4 are typically seen in young horses (less than 2 years of age) however, any age horse can develop the disease. Equine herpesvirus is usually noticed as mild coughing, clear drainage from the nose

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and/or eyes and possibly a fever and decreased appetite. It is highly contagious from horse to horse and will often affect all horses in a barn in a matter of days. This disease is often fatal for newborn foals that acquire the infection in the uterus. However, the disease has a low mortality rate in older foals and adult horses.

The severity of illness associated with this disease depends on prior exposure and the immune status of the individual animal. Affected horses will have an increased body temperature of 102 F to 106 F, which will usually persist for one to seven days and often is higher in the afternoon or evening. They will show varied degrees of depression and anorexia. Secondary bacterial infection commonly appears as a consequence to the viral infections. Nasal discharge is usually clear at first, but often changes to yellow then green after a few days. Horses will typically develop a mild cough and some will have minor lymph node enlargement under their jaws (intermandibular lymph nodes). In uncomplicated cases, most horses will recover in seven to 14 days.

As with other herpes virus diseases, the immunity after natural infection or vaccination is often short-lived. Horses may become re-infected within four to six months of having the disease. Repetitive infections are thought to boost a horse's immunity, so re-infected horses are often asymptomatic. Horses can become carriers of herpesvirus and may shed the virus during stressful events.

Equine Influenza Virus

Equine influenza is caused by two distinct virus types (A-equi-1 and A-equi-2), with A-equi-1 usually causing the milder disease. A-equi-2 can cause severe disease, often resulting in viral pneumonia. Cases of influenza occur most commonly in the spring and fall. Influenza has a short incubation period of only one to three days, and therefore can spread rapidly through a group of susceptible horses. Coughing horses disperse the virus into the air, and other horses are infected when they inhale the virus particles. The virus attacks and damages the lining of the respiratory tract. It takes three weeks for the lining of the respiratory tract to regenerate, which predisposes the tract to bacterial infections or to recurrent airway obstruction (heaves). Some of the lining may actually slough and result in multiple areas of denuded respiratory tract lining. Most horses will be infectious for at least five days after onset of clinical illness. The length of time the virus is excreted will vary among horses, depending on their immunity.

The clinical signs seen with influenza are similar to those associated with other viral respiratory diseases. Fever is usually present and ranges from 103 F to 106 F. Horses have varied degrees of depression and anorexia. In uncomplicated influenza cases, most clinical signs last from two to 10 days, but affected horses often develop a dry, nonproductive cough that can last two to three weeks or longer. The nasal discharge is usually clear at first, but usually becomes thick and pus-like. Intermandibular lymph nodes may become slightly enlarged, and some horses appear to have muscle soreness. Horses with A-equi-2 will show the most severe signs. These horses will often have high respiratory rates, and some will have difficulty breathing. The severe clinical signs seen with A-equi-2 will often be present for seven to 10 days. Horses can develop a generalized vasculitis, which is manifested as swelling of the limbs, inflammation of the heart resulting in a high heart rate and inflammation of the eye resulting in tearing and squinting of the eye. Immunity to equine influenza will last approximately one year after natural infection, two to three months after intramuscular vaccination, and 6 months after intra-nasal vaccination.

Equine Viral Arteritis (EVA)

Equine viral arteritis is a viral disease of horses that can cause respiratory disease and abortions. Even though the virus has a worldwide distribution, incidence of the disease is uncommon but has occurred in Oklahoma. EVA has an incubation period longer than the other viral respiratory diseases, ranging from three to 14 days. The virus is shed in nasal secretions. Stallions affected with EVA may shed the virus in their semen for years and are capable of transmitting the disease to mares. As with other viral respiratory infections, EVA is acquired by inhalation of the virus, exposure to virus-contaminated objects or environment.

The clinical signs associated with EVA infection are similar to other viral respiratory diseases, but can vary from severe to subclinical. However, this disease should be suspected if the following are present:

- more discharge from the eyes than usually seen with other respiratory diseases
- red and inflamed lining in the nasal passages
- swelling in the limbs and ventral abdomen
- abortions during or within a few days of the illness

EVA is a viral disease that is reportable to the state veterinarian's office.

Treatment of Viral Respiratory Diseases

Viral respiratory diseases can mimic more serious respiratory diseases. The attending veterinarian should examine affected horses to determine the seriousness of the illness. Only the symptoms are treated, rather than the cause, with the most important component of therapy for uncomplicated viral respiratory diseases being rest. Stress should be kept to a minimum. If possible, the horse should not be hauled long distances, and forced exercise of any kind should be discontinued. Affected horses should be housed in an area with good ventilation, and dust should be kept to a minimum. Unless the weather is inclement, outside in the sunshine and fresh air may be the best environment for recovery.

It is important to remember that antibiotics are not effective against viruses. However, for the horse with severe viral

respiratory disease or one that is stressed for another reason, appropriate antibiotics may be administered prophylactically to decrease the chances of an opportunistic bacteria causing a more severe disease. It is also important to remember that it can take a prolonged period of time for the respiratory tract to heal from a viral infection. The typical recommendation for rest of the respiratory system after a viral infection is one week of rest for every day of fever.

Complications of Viral Respiratory Diseases

Uncomplicated viral respiratory diseases are usually self-limiting, and the affected horses recover with no long-lasting ill effects. However, horses with viral respiratory diseases that are also stressed by shipping, training, racing, surgery, etc. may develop severe and sometimes fatal pneumonia. Frequent examination of the affected horse's respiratory tract is indicated to monitor for secondary complications like pneumonia, pleuropneumonia and myocarditis (inflammation of the heart). There is also some indication that viral respiratory disease may predispose a horse to chronic obstructive pulmonary disease (heaves) and exercise-induced pulmonary hemorrhage (bleeders).

Bacterial Respiratory Disease

Many bacteria are capable of causing respiratory disease in horses. Some bacteria only cause disease when viruses or other agents have first damaged the respiratory tract. Other bacteria are capable of producing disease independently. For this discussion, we will consider the two most important bacterial diseases for Oklahoma horses: Strangles and *Rhodococcus equi*.

Strangles

Strangles is a bacterial disease caused by *Streptococcus equi*. It is most commonly seen in one- to five-year-old horses. However, any age susceptible horses can get the disease, and older horses that have waning immunity may develop the disease even if they had it at a younger age. There is usually a two- to six-day incubation period, and 30 to 100 percent of the horses on the farm may develop the disease. Horses affected with this disease have a copious thick white to yellow nasal discharge that contains high numbers of the bacteria.

They contaminate the environment, including feed tubs, water buckets and walls with the bacteria. Anything in the horses' environment contaminated with the bacteria (such as handlers' boots and clothes, flies, brushes or halters) can be a source of infection for other horses. Horses acquire the disease by direct contact with the bacteria either by inhalation or ingestion. The bacteria itself may survive in the environment for a few weeks. This disease is difficult to eradicate because some horses shed the bacteria for long periods. Affected horses will typically shed the bacteria for at least four to six weeks. One survey reported that one mare shed the bacteria for ten months, and long-term carriers may be more common than previously thought. Natural immunity to the disease after infection is usually long-lasting. However, some individuals may acquire the disease more than once.

Clinical signs associated with strangles include fever (103 F to 106 F), serous nasal drainage evolving to a thick, yellow to white and copious discharge, moist cough, difficulty swallowing, depression and decreased or nonexistent appetite.

Lymph node swelling between the mandibles and in the throat latch area is usually present. The lymph node swelling with strangles is frequently severe and results in abscesses that often rupture and drain pus.

Strangles can have a high incidence (up to 10 percent) of complications. Complications include becoming a chronic carrier of the disease, asphyxia due to enlarged lymph nodes compressing the larynx or windpipe, bastard strangles (spreading to other areas of the body), pneumonia, guttural pouches filled with pus, purpura hemorrhagica and heart disease. Horses may also develop severe muscle wasting secondary to strangles. The average length for the course of this disease is 23 days.

***Rhodococcus equi* Pneumonia**

Rhodococcus equi pneumonia is a sporadic disease that usually occurs in one- to six-month-old foals. It is endemic on some farms, and the disease will appear in one to 10 percent of each foal crop. Most infections will be in foals two to three months of age, which is when maternal antibody concentration is waning. Foals can be infected at birth, but will not show signs of illness until one to six months of age. The organism is commonly found in the soil and can often be cultured from the feces of dams that had affected foals and of normal horses. Foals probably become infected by inhalation of the bacteria from the soil. The disease does not appear to be transmitted by direct contact between horses.

One of the major problems in dealing with *Rhodococcus* pneumonia is it has an insidious onset. Foals usually start with a low-grade fever, but may have temperatures up to 106 F. They may or may not cough in the initial stages of the disease. Often there is no abnormal nasal discharge early in the disease process. As the disease progresses, the foals become depressed, nursing is diminished, difficult breathing becomes apparent, and weight loss or failure to grow may be evident. In addition to respiratory disease, *Rhodococcus equi* can cause diarrhea, septic and nonseptic synovitis (joint inflammation), bone infection and intra-abdominal abscessation.

The fundamental components of *Rhodococcus* pneumonia treatment are early detection, rapid and accurate diagnosis and specific antibiotic therapy. It is often necessary to continue the antibiotic therapy for several weeks.

Control of *Rhodococcus equi* pneumonia is very difficult even with current knowledge and available products. No commercial vaccine is available. Prophylactic hyperimmune serum administered intravenously has been reported to be effective. Other prophylactic protocols have been published and may be worth discussing with your veterinarian. Since it is thought the natural disease is acquired by inhalation and we know the bacteria are in the soil, it may be beneficial to reduce dust and properly ventilate housing. As with all respiratory diseases, reduce stress by not overcrowding and by keeping the handling of foals to a minimum. Frequent removal of manure will help minimize environmental contamination and may reduce the incidence of infection. It is also important to verify that the foal has had proper colostrum intake shortly after birth.

Respiratory Diseases Caused by Internal Parasites

Two equine internal parasites migrate through the lungs as a portion of their life cycle. The equine roundworm is one

of the most common internal parasites of young horses. It is probably present in every horse operation in Oklahoma. After this parasite is ingested by the horse, it then migrates from the intestine to the liver and then to the lung, where it is coughed up and swallowed to become an adult in the intestine. Foals given large numbers of the parasite experimentally develop a cough and nasal discharge similar to other respiratory diseases. In uncomplicated cases, the horse's temperature remains near normal. It is unknown if under natural conditions this parasite causes clinically detectable respiratory disease. However, it is quite possible the damage caused by this parasite predisposes young horses to other respiratory diseases. For this reason, a good deworming program is recommended for all foals. Most horses develop a resistance to roundworms by two to three years of age.

The equine lungworm, even though not commonly seen in Oklahoma, can cause chronic coughing in affected horses. Horses are not the favorite host of this parasite and do not usually transmit the disease to other horses. In most instances, horses acquire this disease when pastured with donkeys.

Prevention Program to Control Respiratory Diseases

Each horse owner, in consultation with their attending veterinarian, should develop a written vaccination program appropriate for their situation. Accurate vaccination records should then be maintained on all horses. All horses in Oklahoma should be vaccinated in the spring for eastern and western encephalomyelitis, tetanus and West Nile Virus (WNV). Additional vaccinations may be recommended for your horses to prevent respiratory diseases. A local veterinarian can prescribe the best vaccination program for your particular situation.

Although vaccination programs may vary according to the environment in which horses live, for specific information on the above viruses and bacteria and to consider when developing a vaccination program for your horse, please consult the Equine Vaccination Programs VTMD-9119. Horses, once vaccinated with an effective vaccine and then revaccinated, have what is termed an anamnestic response. This response is very rapid (just a few days) and produces high levels of protective antibodies. With some planning, the anamnestic response can be utilized to protect horses that will subsequently be stressed or exposed to respiratory diseases. For this reason, horses participating in sales, shows, racetracks, etc. can be better protected by a booster vaccination two to four weeks prior to the event.

The newborn foal obtains protection from respiratory diseases from their dams' colostrum. This colostrum provides passive immunity. Colostrum protection or passive immunity lasts a varied amount of time, which is related to the amount of protective antibodies in the colostrum and how fast the antibodies are used up by the foal. To further boost the passive immunity of the colostrum transfer to the foal, it is also advantageous to keep the mare at the facility where she is to foal at least six to eight weeks prior to foaling.

Colostrum antibodies against some diseases last longer than others. In general, the protective levels of antibodies acquired from the dam are too low to be protective by two to three months of age. But if you vaccinate a foal at this age, a problem arises because the residual maternal antibodies will cause the foal's immune system to be unresponsive to vaccinations. This effect can last for weeks or months.

Vaccination is not a substitute for good management practices. Respiratory infections spread through groups of horses by direct contact between animals, handlers and contaminated surfaces or through inhalation. A producer can minimize the spread of infectious organisms by quarantining all animals brought onto the farm, especially those returning from events such as shows, racetracks or sales. It may be necessary to quarantine these animals for up to four weeks before they are allowed to commingle with resident horses. If possible, pregnant mares should be kept in a group away from other horses, especially weanlings and yearlings. When cases of respiratory disease or abortion occur, all affected horses should be isolated and not allowed to commingle or leave the

premises until three weeks after recovery. Handlers caring for the sick horses should limit their contact with healthy horses, and stalls, trailers. Equipment that has come in contact with sick horses should be disinfected with products containing phenols, chloride or quaternary ammonium. It is also best for healthy horses to be housed in a separate airspace from sick horses.

Consult your veterinarian concerning vaccination protocols. A veterinarian can evaluate each horse as an individual, considering age, health and environment, to recommend vaccination and management programs that will provide maximum protection for each horse.

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