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## **Inflammatory airway disease Craig T. Roberts, DVM**

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Second only to musculoskeletal problems, airway disease in performance horses is the most common cause of poor performance and lost training time. Two main syndromes are seen which make up the most common lower lung disorders in high-speed performance horses. These are Inflammatory Airway Disease (IAD) and Exercise Induced Pulmonary Hemorrhage (EIPH). Upper airway abnormalities are also common and include a large array of possibly abnormalities, many of which can be frustrating to diagnose or misdiagnosed without viewing the actual abnormality at speed (during a treadmill exam).

IAD affects up to 50% of Thoroughbred racehorses. It is often seen as a chronic cough and slight nasal discharge. Rarely will abnormal lung sounds or a fever be associated with this condition. On occasion, excess mucous may be seen on an endoscopic exam of the back of the throat. However, even chest radiographs are often poorly correlated to the significance of the condition seen in training. The most consistent indication that IAD may be a problem is poor exercise tolerance and performance for the amount of conditioning and training put into a horse.

The causes of IAD are not well defined, but have recently been considered to be a possible persistent viral respiratory infection as opposed to some sort of breathed atmospheric irritant or allergic response. This condition is best diagnosed by way of a bronchoalveolar lavage (BAL) procedure. A BAL consists of passing a special tube, like a nasogastric tube, into the lungs. A special balloon at the end of this tube is then inflated to allow a small section of the lung to be isolated. Sterile fluid is then passed into the tube and subsequently sucked back out to collect a sample of cells from this section of the lung for detailed evaluation. Based on the number and types of cells seen, much can be learned about ongoing lower airway problems. This procedure is done under mild sedation and is not complicated, nor terribly uncomfortable for the patient.

EIPH is not only a racehorse disease, but also affects other high performance horses. For example, three day competition, polo ponies, barrel racers and

even draft horses used in pulling competition can all suffer poor performance from EIPH. Horses in endurance type competitions, however, tend not to experience EIPH concerns, as the intensity of these events on the lower airway is not as extreme. To date, a full understanding of the cause of EIPH has not been fully understood. However, several good theories have been proposed and are still under investigation. Some researchers have considered that this may be a normal response due to massive demand for increased blood supply to the body during competition. This tremendously increased demand causes, not only a higher heart rate, but also increased blood pressure. It is this increased pressure that may cause a “stress” failure or leaking of the small vessels in the lungs as a result.

EIPH is often diagnosed by endoscopic examination after training or racing. Blood in the throat or trachea is commonly seen between 30 and 90 minutes after significant exercise. A BAL may be useful in some cases, however, as not all horses that suffer from EIPH will be evident on post-training endoscopic exams. Similarly, it has recently been proposed that IAD and EIPH may go hand in hand in some horses. Which disease comes first is unknown, but bleeding sets up a good environment for IAD to occur. At the same time, IAD causes chronic irritation to the lungs and thus stimulates the production of fragile new blood vessel growth. These fragile blood vessels beds are more likely to bleed under stress of training. Therefore, the two together can be a self-perpetuating cycle.

Note that unlike an endoscopic exam following training, a BAL is not as time sensitive as to when it is performed as the cells found in the lower lung will be relatively consistent for a horse in training throughout the day. In some mild cases, however, where an airway problem of some kind is suspected an increase in number of red blood cells may be more apparent soon after exercise. This is more often the case of a horse with poor performance that is being fully evaluated on the treadmill for a medical condition to explain the poor performance. Most often after upper airway, cardiac and musculoskeletal problems have been ruled out as the cause, this procedure is performed. In these cases a treadmill examination is performed followed by a BAL 30-90 minutes post-exam.

Although these lower airway conditions can be very performance limiting, new inhaled drug therapies and drug combinations are becoming more readily available. Similarly, new systemic treatments for underlying respiratory infection have also become more available. Now, once a definitive diagnosis is reached, many horses can be placed on appropriate short and long-term therapy to return to or enhance their current levels of performance. As new research continues to improve our understanding of these two complex disease syndromes, the future for their successful treatment will only improve. The first

step, however, is recognizing the signs of poor performance and understanding that these lower airway diseases can be the cause.