

Kentucky Equine Research

Heart Problems in Horses

By [Catherine Bishop](#) · December 20, 2010

The circulatory system (heart and blood vessels) and respiratory system (lungs and airway) work together to provide oxygen and transport waste material from the horse's tissues. During exercise, the circulatory and respiratory systems are the mechanisms that allow the horse's musculoskeletal system (bones, connective tissue, muscles) to produce motion from energy. Without any one of these components—circulatory, respiratory, and [musculoskeletal](#) systems—performance would be impossible.

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According to Dr. Robert Gilmour, a veterinarian at Cornell University, diseases of the circulatory system are the third most important cause, after respiratory and musculoskeletal disorders, responsible for loss of performance. Though classic “heart attacks” similar to those suffered by humans are quite rare in horses, there are a number of heart problems that can cause poor [performance](#) and even death.

Signs of a heart problem might include a loss of condition, shortness of breath, slow recovery after exercise, an increased effort to breathe, a shorter period of exercise before development of fatigue, and general weakness. Fluid accumulation in the abdomen, legs, or under the skin surrounding the ribs is another indication of poor heart function. Owners or trainers who suspect a disorder should contact a veterinarian who can examine the horse's heart and determine the cause of the problem.

A Thoroughbred horse's heart weighs between 8 and 10 pounds (3.5 to 4.5 kg). It consists of two receiving chambers, two pumping chambers, and a number of one-way valves to allow blood to be moved from one chamber to another. A chamber on the heart's right side collects blood that has circulated through the body, picking up cellular waste. This “dirty” blood is pumped to the lungs through the pulmonary artery. Chambers on the heart's left side receive oxygenated blood returning from the lungs and send it back out to the body.

Electrical signals tell the heart muscles to contract, causing the flow of blood. The continuous “lub-dub” sound of the beating heart is caused by the closing of the heart valves with each beat. At rest, a horse's normal heart rate is about 28-50 beats per minute, though it can rise to well over 200 beats during hard exercise.

Cardiac arrhythmias (irregular heartbeats) are more common in the horse than in other domestic species, and atrial fibrillation, a condition in which the upper chambers of the heart may beat up to 400 times a minute, is the most common heart problem that affects performance. Though the upper chambers are contracting almost non-stop, the rapid fluttering action does not produce significant circulation of blood into the lower chambers, negatively affecting performance. Atrial fibrillation occurs relatively frequently when horses race, sometimes resolving on its own after the race, according to studies at Ghent University in Belgium. Atrial fibrillation also predisposes horses to [exercise-induced pulmonary hemorrhage](#), or “bleeding.”

Adequate blood circulation requires strong heart muscle tissue and an unimpeded flow through the heart and blood vessels. Any structural abnormalities can restrict cardiac output, limiting performance. Small abnormalities are detected as heart murmurs when the smooth flow of blood is disrupted slightly. This is a common finding during routine examination, with some estimates putting heart murmurs as high as 65% to 80% of horses in athletic training. Most of these result from minor irregularities in the heart structure and usually do not affect a horse’s performance.

Very loud murmurs may indicate a more serious congenital heart defect, though these are rare in horses. One of the most common equine congenital defects is a hole in the septum or wall that separates the lower and larger heart chambers. Small holes are usually well-tolerated and may not affect the horse’s performance.

Horses that appear healthy but then suddenly collapse and die may have had an aortic aneurysm. The aorta is a large blood vessel that carries oxygenated blood from the heart to the rest of the body. Normally very tough and strong, the walls of the aorta can develop a weak or thin area that ruptures, resulting in severe internal bleeding. Because the presence of an aneurysm is usually not detected in routine examinations, there is no way to predict or prevent these sudden deaths. Commonly reported as an equine heart attack, aortic rupture is in no way similar to the human malady of that name.

Other heart problems can be the result of injury or trauma to the heart structure, disruption of electrical signals, or illness elsewhere in the body. Heart disease can develop quickly or over a period of time. Acute problems can be caused by toxins from snakebite; drug-induced electrical malfunction; bacterial or hormonal reactions; lesions in the heart muscle, lining, valves, or pericardium, the sac that surrounds the heart; or direct injury such as gunshot or impalement on a fence post. Chronic disease may be due to birth defects, cancer, or systemic illness that overwhelms the heart’s ability to deliver oxygen to the body’s tissues.

Veterinarians use tools such as ultrasound (echocardiography) and electrocardiograms (ECG) to diagnose heart problems. Several types of ultrasound are available to produce two-dimensional images of the heart’s physical structures. An ECG records electrical impulses that show the rhythm and speed of the heart beat. An ECG taken while the horse is exercising can show irregularities that may not be detected while the horse is at rest.