

## The Ferret Circulatory System

**What happens when a ferret's heart, blood and blood vessels work well, and what happens when they don't.**

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Posted: May 1, 2009, 5 a.m. EDT

### The Ferret's Blood Vessels

There are a few different kinds of blood vessels. The large blood vessels that carry oxygenated blood are called arteries. The largest artery is the aorta. It is the vessel that carries blood out of the left ventricle of the heart. As the arteries travel through the body, they divide and become smaller. The smaller vessels are called arterioles. Arterioles also become smaller until they become capillaries. Oxygen is released from the capillaries and carbon dioxide enters the capillaries.

As the blood starts its journey back to the heart, the capillaries develop into the larger venules. The venules develop into the larger veins. The veins finally dump the unoxygenated blood into the right atrium. The veins commonly used to give intravenous (IV) fluids and medications in ferrets include the cephalic vein in the forearm and the lateral saphenous vein in the lower leg, just above the ankle. The veins commonly used to collect blood samples are the cranial vena cava inside the top of the sternum and the jugular vein in the neck.

Fortunately ferrets do not develop hardening of the arteries (atherosclerosis) like people do, but they can develop blood clots and vasculitis. Ferrets with heart disease are prone to having a blood clot develop at the distal end of the aorta near the rear legs. This is commonly called a saddle thrombus. Vasculitis is inflammation of the blood vessel wall and is common in Aleutian disease, Ferret Infectious Peritonitis, and in some immune-mediated diseases.

### The Ferret's Blood

The last part of the circulatory system is the blood itself. The average male ferret has about 2 ounces (60 milliliters) of blood in his body, and the average female ferret has less than 1.5 ounces (40 milliliters) of blood in her body. Blood is made up of four things: red blood cells, white blood cells, platelets and plasma. Red blood cells have the main function of carrying oxygen to the organs and bringing carbon dioxide back to the heart. White blood cells have many functions but are mostly involved in the immune system. Platelets are sticky, and plug leaks and holes in the blood vessel walls. They are also involved in forming blood clots. The plasma is the watery part of the blood. It is about 90 percent water and carries nutrients, such as proteins and electrolytes, to the organs.

Part of the routine blood work is the complete blood count (CBC). The CBC includes information on the number of red blood cells, white blood cells and platelets. The CBC can determine if the ferret has anemia and help determine the type of anemia.

The main problem with the blood involving the circulatory system is anemia. Anemia is basically a deficiency in red blood cells. A deficiency in red blood cells means a decrease in the amount of oxygen the blood can carry to the organs and a decrease in the amount of carbon dioxide the blood can carry away from the organs, which results in a ferret that does not feel good.

Many medical problems can cause anemia in ferrets. High estrogen levels in an intact female that stays in heat or in a ferret with adrenal gland disease can cause the bone marrow to stop producing red blood cells and cause a moderate to severe anemia. Kidney disease can also cause the bone marrow to decrease the production of red blood cells and cause a mild to severe anemia. Chronic diseases like insulinoma, adrenal gland disease and heart disease can cause a mild to moderate anemia. Stomach ulcers and inflammatory bowel disease can cause blood loss and a mild to moderate anemia. Cancer such as lymphoma can cause a mild to severe anemia. Infectious diseases such as Aleutian disease and Ferret Infectious Peritonitis can cause a mild to severe anemia.

The ideal treatment of anemia is to correct the underlying problem that is causing the anemia; however, some cases also require blood transfusions to correct the anemia. Fortunately, ferrets do not have blood types like people do, so any healthy ferret can be used as a blood donor.

The ferret circulatory system is complex. Many diseases can affect the ferret's circulatory system, but many of these diseases can be managed with the proper medications.



Dr. Jerry Murray practices at The Animal Clinic of Farmers Branch in Dallas. He currently has two senior ferrets (Bam-Bam and Mr. Slate) and one hyperactive Rottie puppy (Katarina).

<<Page 1