

HEARTWORM DISEASE

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A reader states they have heard of a condition in dogs called heartworm disease. Can you please explain what this is and should we be concerned about it?

There are many types of worms that can infest the body of our four-footed friends. The heartworm is a member of a group of parasites that inhabit and live inside the body, mostly within the bloodstream. The heartworm infests mostly dogs, but it can and does infest the body of the domestic house cat as well. In fact it can infest many species of animals.

The parasite is called *Dirofilaria immitis*. It is found all over the world. Since about the 1930's the heartworm has been endemic (present continuously in cycles) in the United States with the highest incidence on the entire southeast coastal areas and Gulf States, which includes the areas devastated by hurricane Katrina. It has originally spread from other moist semi-tropical to temperate areas of the world to the U.S. In the United States, the worm is found especially within a hundred miles of the coasts. It is also found in river valleys, marshland areas, and literally in most places where its intermediate or carrier host the mosquito is found. Yes, the heartworm depends on the mosquito for it to be successfully spread around and transmitted to its definitive or final host, the dog and cat! The reason why heartworm disease spreads in the first place is that the infested animals who are carrying the parasite in their bloodstream are traveling to other areas where the disease is not present. It takes a long time to become established (endemic) in a local area, but the more movement of infested pets that are not treated, the more heartworm disease spreads to healthy animals that are not infested in clean areas. The state of Washington is one of those so called cleaner areas. We have plenty of mosquitoes which can transmit the parasites, but there have not been that many heartworm positive dogs around here to get the ball rolling. There are certainly pockets or hot bed areas in these parts, where monitoring pets for the infestation should be a part of routine annual health care. The Everett area is NOT one of those places.

Like malaria, which is also spread by mosquitoes, the small heartworm larvae, called microfilaria, are picked up by the mosquito when it bites the already infested dog. These microfilaria which means (tiny threadworm) go into the mosquito's body, and develop for awhile until the mosquito bites another non-infested dog or cat. These little worms then migrate down the probe of the mosquito, and back into an uninfested pet. It is very interesting to note that the microfilaria increase in numbers in the circulation from 4-11pm in the evening when the mosquitoes are out and busily biting. It's like they know that the mother ship is waiting to pick them up and transport them aboard. These worms migrate around through the tissues of the body (muscles and fat), and develop for about 3-4 months before they finally get to the heart. It takes a full 6 months for the worms to finally develop into adults that will again start to give birth (gravid) to thousands of new

microfilaria larvae which will get into the blood circulation, and be picked up by new mosquitoes. Thus we have a very simple, and very effective life cycle that ensures the spread and survival of each new successive generation of heartworm. This all happens of course at the expense of our pet's health. The adult heartworm becomes very long, about 6-10 inches in length. Depending on how many mosquitoes bite, over a certain period of time also determines how many adult worms will end up in the heart. These worms will occupy the right side chambers of the heart, and also get into the large and smaller blood vessels of the artery supply to the lungs. This is where the worms do their damage to the health of the animal, and can lead to an early death, or at least to chronic illness.

A heavily infested medium size dog can harbor from 25 to 50 adult worms or more in the heart and pulmonary artery. The symptoms of severe heartworm disease are breathing difficulty, inability to exercise, coughing (sometimes with blood coming up), fainting spells, heart arrhythmias, weight loss, and even progressing to heart failure. The majority of heartworm infested dogs do not have any symptoms, or very few, for about two years, and then they begin to get ill with all types of lung and heart difficulties, including blood clots and sudden collapse. The amount of illness totally depends on the number of adult worms there are in the heart, and how long they have been there.

There are many ways to diagnose whether your dog has heartworms. If there are no symptoms there are blood tests which can see the tiny microfilaria in the microscope, or can detect the presence of the heartworm tissue or the animals own immune antibodies. If there are real physical symptoms then often radiographs (x-rays), electrocardiograms (ECG), and analysis of airway fluids can tell us that the dog is infested. At least 35% of dogs severely infested will die without treatment.

Treatment involves killing the adults in the heart and the immature microfilaria in the bloodstream. This method uses toxic intravenous arsenic compounds which are a form of chemotherapy. The adult worms die slowly, and then the body destroys, and reabsorbs them, with the healing time taking weeks to months. This treatment and the followup is expensive, and can be very dangerous as the damage to the body from the dying worms is much worse than live worms cause by being there in the first place. Treatment is usually about 85% successful. Sometimes it is necessary to retreat in a year as not all of the adult heartworms are killed the first time around. If the dog is older than 12 then treatment success is poor. Prevention of course is always better than to let the infestation get started in the first place. There are oral preventative medicines that can be given every 6 to 8 weeks only during the mosquito biting season in those geographical areas that have heavy heartworm presence. These preventative medicines kill any heartworm larvae that have been introduced by the bites of infested mosquitoes. By killing the larvae the heartworm infestation never gets started in the first place.

Dogs that are mainly outdoors get more heartworm than mostly indoor dogs due to the increased exposure to the mosquitoes. The age group most often affected is 4-7 years old with the majority of the dogs being males. Most of the dogs infested are also larger breeds, but the length of the hair does not make a difference.

After the devastating hurricanes in the Gulf area this fall many dogs and cats became orphaned, and have been transported to many areas of the U.S. including the Puget Sound area for adoption or respite care. Many of these animals are moderately to severely affected with heartworm disease. It is paramount that they be examined, and receive the treatment that they need for their own health as well as to prevent the spread of

heartworm unnecessarily to our cleaner area. Dr. Doug has personally only treated one dog with heartworm in his 25 years of practice, and that dog brought the infestation in a move from Georgia. It just isn't very common here! Many clinics will push dog owners to use monthly oral heartworm preventative medicines here in this area, and we feel that this recommendation is unhealthy, mostly unwarranted, and unnecessary. A comprehensive annual physical, with possible selected appropriate blood tests, minimal vaccines, good diet and common sense will prevent most if not all heartworm infestations from developing in our area.