

**Study of Veterinary Practices and Canine Disease in Dominica
Compared to the Unites States**

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Abstract:

Routine vaccinations for canines in the United States are recommended annually. They receive a distemper, parvo, and rabies vaccination yearly. Also, a fecal sample is taken to test for intestinal parasites and a blood test is done to test for heartworms. This level of care and treatment was compared to canine care in Dominica.

Introduction:

During a study abroad trip to Dominica I observed how pets were treated and taken care of. Many of the same diseases that effect dogs in the United States are also on the island. Dominica is a tropical island that is very humid. During January the average temperature is 76°F and in June the average temp is 81°F, which is not much of a difference. Every state in the US has a winter, some worse than others and temperatures can drop drastically. The temperatures during January and June are not similar. In the United States many pets are treated as a child would be: taken to the veterinarian regularly, fed table food or a high protein dog food, and some even sleep in beds. In most countries, dogs are not treated like this.

Methods and Materials:

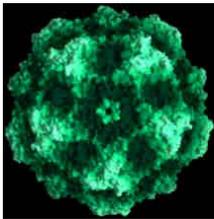
To find out information about certain diseases and vaccinations that are present on the island I contacted a local veterinarian. When I looked in the phonebook to look up veterinary clinics on the island I found one veterinary clinic that was listed which was located in Portsmouth. I called the clinic and the receptionist gave me the doctor's

personal cell phone to interview him. I spoke to Dr. Nyaku who informed me of annual vaccinations given to dogs on the island. Also, I gained a lot of information from just riding in the bus on our field trips all over the island and observing or asking people questions about how they take care of their pets.

Results and Discussions:

Canine parvovirus, CPV, infection is a relatively new disease that appeared in 1978 in the United States. The causative agent of CPV disease is a virus. The main source of the virus is the feces of infected dogs. The stool of an infected dog can have a high concentration of viral particles. Susceptible animals become infected by ingesting the virus. Subsequently, the virus is carried to the intestine where it invades the intestinal

wall and causes inflammation. Unlike most other viruses, CPV is



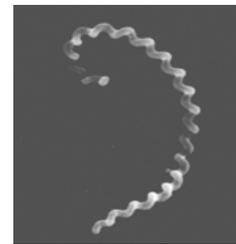
stable in the environment and is resistant to the effects of heat, detergents, and alcohol. CPV has been recovered from dog feces even after three months at room temperature. Due to its stability, the virus is

easily transmitted via the hair or feet of infected dogs, contaminated shoes, clothes, and other objects. Dogs that become infected with the virus and show clinical signs will usually become ill within 7-10 days of the initial infection. Generally signs of the virus are severe vomiting and diarrhea. The diarrhea may or may not contain blood.

Additionally, affected dogs often exhibit a lack of appetite, depression, and fever. It is important to note that many dogs may not show every clinical sign, but vomiting and diarrhea are the most common signs in which vomiting usually begins first. Parvo may affect dogs of all ages, but is most common in dogs less than one year of age. Young puppies less than five months of age are often the most severely affected and the most

difficult to treat. There is no treatment to kill the virus once it infects the dog. However, the virus does not directly cause death; rather it causes loss of the lining of the intestinal tract. This results in severe dehydration, electrolyte imbalances, and infection in the bloodstream. When the bacteria that normally live in the intestinal tract are able to get into the blood stream, it becomes more likely that the animal will die. The first step in treatment is to correct dehydration and electrolyte imbalances. This requires the administration of intravenous fluids containing electrolytes. Antibiotics and anti-inflammatory drugs are given to prevent or control septicemia. The best method of protecting your dog against CPV infection is proper vaccination. Puppies receive a parvo vaccination as part of their multiple-agent vaccine given at 8, 12, and 16 weeks of age. In some situations, veterinarians will give the vaccine at two week intervals and an additional booster at 18 to 20 weeks of age. After the initial series of vaccinations when the dog is a puppy, all dogs should be boosted at least once a year. Pregnant canines should be boosted within two weeks of whelping in order to transfer protective antibodies to the puppies. In Dominica it is very prevalent because few people vaccinate their pets. So many stray dogs spread the virus all over the island. Parvo is frequently vaccinated and sometimes over vaccinated for in the states because it is such a brutal disease.

Leptospirosis is an infection caused by the bacteria *Leptospira interrogans*. The disease has been recorded worldwide and has been known to spread among many animal species, including dogs. In Dominica this infection is very common. This is most likely due to heavy rainfall on the island and stagnant water all over. In canines, leptospirosis



represents a severe kidney and liver infection. If not treated timely, a chronic kidney disease is a common continuation of this bacterial infection. Animals are usually infected with *Leptospira* bacteria through contact with contaminated water or fluids and tissues from infected animals. The bacteria can survive in moist conditions for weeks and months. Rats, mice and many wild animals such as raccoons, opossums and skunks can adapt to different types of *Leptospira* and serve as reservoirs of the bacteria by spreading it to other animals. This condition can spread to the placenta and fetus. Chronic leptospirosis is known to be the cause of abortion, stillbirth, infertility and reduced litter size. Unvaccinated puppies or puppies whose dams were not vaccinated are at greater risk of severe disease and death. Clinical signs of leptospirosis vary in severity. Many infections are asymptomatic (no clinical signs) and the incidence of this bacterial infection in dogs may be greatly underestimated. The severity of clinical signs is influenced by such factors as a dog's age, vaccination status, the route and degree of exposure. Chronic cases of infections are often associated with no apparent illness or only fever of unknown origin and mild to severe conjunctivitis, which causes red eyes. In the States leptospirosis is less frequently vaccinated for each year. Many people have fences or keep their dogs indoors where there is no contact with any stagnant water.

Heartworm disease, dirofilariasis, is very serious and can be potentially fatal in dogs. As the name implies, the condition involves worms residing in the heart and major blood vessels. The female worm is 6 to 14 inches long and 1/8 inch wide while the male is about half the size of the female. A severely infected dog can have as many as 300 worms. Of course these large worms do not enter a dog's body as adults. They arrive as larvae in the saliva of mosquitoes. Before a mosquito draws blood, she first pumps a

small amount of saliva into her victim. This saliva acts as an anticoagulant – and may carry disease. In the case of heartworm transmission, the mosquito bite can start a process that takes years to develop. Heartworm is found on every continent except Antarctica. At least 70 of the 3000 species of mosquito are known to carry heartworm worldwide. In the



U.S., at least 16 species of mosquitoes have been confirmed as vectors. In Dominica it is not known how many species of mosquitoes serve as vectors, but it is known that heartworm disease exists on the island. Sexually mature nematodes discharge tiny immature worms, less than 1/800" long, called microfilaria into the

bloodstream of the infected dog. Though they are not able to develop further inside the dog, these tiny creatures can survive in the blood for up to three years. In order to complete their life cycle, the microfilaria must infect a mosquito. The mosquito is infected when biting a sick dog and sucking microfilaria through her proboscis. Once inside the mosquito's body, a microfilaria lives and develops over a 2-3 week period. It transforms twice and becomes a larva, at which time it moves into the mosquito's mouthparts. The next time the mosquito goes for a blood meal, the larva stays behind on the victim's skin. It enters the skin through the insect bite and burrows into the skin where it stays for 3-4 months. Heartworm symptoms may develop slowly. In fact, they often are not detected until many months or years after initial infection occurs, which is why heartworm is rarely diagnosed in puppies. Symptoms may include chronic coughing, fatigue, and labored breathing. The huge worms clog the heart and major blood vessels leading from the heart. This causes the blood supply to other organs of the body to be

reduced. As the disease progresses, some dogs develop lung, heart, or circulatory problems. If left untreated, many dogs collapse during the final stage of the disease. Heartworm disease is found in every state in the United States. It is much more common in the southern states due to the warm climate. Mosquitoes are much more common in warmer climates because if the winter is not cold enough it does not kill the mosquitoes off, therefore they survive all year. Dominica is a perfect habitat for mosquitoes due to the warm, rainy, humid climate. In the states heartworm preventative is bought regularly by pet owners through a veterinarian to prevent this disease.

Canine distemper is a contagious, incurable, often fatal, viral disease that affects the respiratory, gastrointestinal, and central nervous systems. Distemper is caused by the canine distemper virus, CDV. Canine distemper occurs worldwide, and once was the leading cause of death in unvaccinated puppies. In recent years widespread vaccination programs have dramatically reduced its incidence. The development of a vaccine in the early 1960s led to a dramatic reduction in the number of infected domestic dogs. It tends to occur now only as sporadic outbreaks. Young puppies between 3 and 6 months old are most susceptible to infection and disease and are more likely to die than infected adults. Nonimmunized older dogs are also highly susceptible to infection and disease. Infected dogs shed the virus through bodily secretions and excretions, especially respiratory secretions. The primary mode of transmission is airborne viral particles that dogs breathe in. Dogs in recovery may continue to shed the virus for several weeks after symptoms disappear, but they no longer shed the virus once they are fully recovered. Macrophages, cells that ingest foreign disease-carrying organisms, like viruses and bacteria, carry the inhaled virus to nearby lymph nodes where it begins replicating. It spreads rapidly

through the lymphatic tissue and infects all the lymphoid organs within 2 to 5 days. By day six to nine, the virus spreads to the blood. It then spreads to the surface epithelium cell lining of the respiratory, gastrointestinal, urogenital, and central nervous systems, where it begins doing the damage that causes the symptoms. Early symptoms include fever, discharge from nose, loss of appetite, and mild eye inflammation that may only last a day or two. Symptoms become more serious and noticeable as the disease progresses. The initial symptom is fever 103°F to 106°F, which usually peaks 3 to 6 days after infection. The fever often goes unnoticed and may peak again a few days later. Dogs may experience eye and nose discharge, depression, and loss of appetite. Although this virus is found worldwide, it is not vaccinated for or proven to be found in Dominica. The virus is very common in the United States and recommended to be vaccinated for yearly.



On the island of Dominica there have been no cases of rabies in any species. Therefore the dogs are not vaccinated yearly for rabies. In the states it is a law that your pet be currently vaccinated for rabies and is enforced due to the numerous rabies accounts each year. Once infection occurs, the rabies virus grows in muscle tissue and may go undetected for several days or months. During this incubation period, the animal appears healthy and shows no sign of infection. Usually within 1 to 3 months, the virus migrates to the nerves near the site of the infection and spreads to the spinal cord and brain, the central nervous system). It usually takes from 12 to 180 days to spread through the peripheral nerves to the central nervous system. At this point, the disease progresses rapidly, and the animal begins to show the classic behavioral signs of rabies. The virus

spreads to the saliva, tears, breast milk, and urine. The animal usually dies within 4 or 5 days. Rabies causes typical symptoms. The infection progresses in a predictable manner, from the initial prodromal phase to the excitative, or furious, phase to the final paralytic



phase. The most common sign of a dog being infected with rabies is

their behavior. Rabid animals usually stop eating and drinking, and

may appear to want to be left alone. After the initial onset of

symptoms, the animal may become vicious or begin to show signs of

paralysis. Some rabid animals bite at the slightest provocation and

others may be somnolent and difficult to arouse. Once the animal shows signs of

paralysis, the disease progresses very quickly and the animal dies. In the United States

there is a law that states if a dog attacks or breaks the skin of a human then the canine has

to be quarantined for ten days to be observed for rabies. This is true even if the canine is

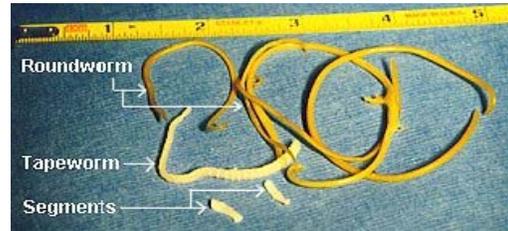
currently on rabies vaccination and after the ten day period the canine must receive an

additional rabies vaccination before being released.

Intestinal parasites are very common in all ages of dogs, but especially puppies. There are a few different types such as: tapeworms, roundworms, hookworms, and coccidian. Tapeworms are caused by the animal actually ingesting the worm releasing it into the gastrointestinal tract, where growth into an adult occurs. Eggs are shed in small segments into the environment through bowel movements. Roundworms are very common and occur in 85% of puppies. Contaminated feces can infect any age of canines. Immature larvae undergo migration from the gut into various tissues. The majority of the larvae migrate through the liver, diaphragm, lungs and up the major airways. As they move up the trachea, occasionally several worms will be coughed up by the pup and

discovered in the expectorant. Most of worms will continue their migration and be swallowed, moving down the esophagus, into the stomach and back into the small intestine where they reach adult status and begin shedding eggs. Signs of roundworms can be serious in puppies producing abdominal pain, bloating, dull coat, diarrhea and occasionally fatal small bowel obstruction.

Hookworms are common parasites of dogs regardless of age. They are most common in warm humid climates but exist all over North



America. The worms are transmitted by chance skin penetration by the immature larvae or by ingestion of contaminated feces. After eggs are deposited onto the ground in the feces, hot humid temperatures will precipitate the development of larvae. After skin penetration, migration of the larvae into the blood stream carry them around the body and into many tissues. Most are brought to the lungs and like roundworms are swallowed back into the intestinal tract 3 weeks later. As mature hookworms, they attach to the lining of the intestinal track and suck blood. Hookworm larvae also migrate into the gestating pup and continue to mature when the pup is born. Puppy hookworm can be profound and require strong supportive care. Severe hookworm infection can cause anemia, intermittent bloody diarrhea, dull dry hair coat, and weight loss. Many of the stray dogs that I observed during my stay in Dominica are very skinny and this is most likely due to hookworms. After months of being infected with hookworms, they can drain the dog of all its energy and blood which can cause the dog to be lethargic or even death.

To determine if a dog has an intestinal parasite, a fecal sample is observed under a microscope which would show shedding of eggs. Tapeworms can show on the fecal, but

are most likely diagnosed through observing the worms around the rectal area. All of the intestinal parasites above can be easily prevented or treated if not left untreated for a long period of time. Tape worms are cured easily by either oral medication or by injection under the skin. Several drugs are available such as praziquantel, epsiprantel, fenbendazole and mebendazole. The best preventative is good flea control. Treatment of roundworms in puppies consists of oral medication at 4, 6 and 8 weeks. Pyrantel pamoate is one the more common effective inexpensive wormers. Other wormers include dichlorvos, febantel, fenbendazole, ivermectim and piperazine. Treatment involves one of many good drugs available in mild cases and can use the same oral medications that are used to treat roundworms. In more severe cases pyrantel pamoate, intravenous fluids, blood transfusions, and good nutritional support are very important. Approved heartworm preventative can also prevent roundworms and hookworms if given properly. If an animal is started on heartworm preventative and already has roundworms or hookworms there is a 50% chance that the medicine will rid of the intestinal parasites.

On the island, I have learned that many people do not take care of their dogs as people would in the United States. Sure, not all people in the states take their pets to the veterinarian regularly, but the vast majority does. Most people from Dominica only consider them as guard dogs and are there to watch the property. Some are never taken to the veterinarian and few are fed appropriate dog food. If the dog gets sick it is not rushed to the veterinarian. In the US, there is always at least one clinic that is open 24 hours a day just in case someone is in need of a veterinarian at any hour of the night.

In the United States there are numerous humane societies and veterinarians in every city. They enforce spaying or neutering your pets and vaccinating. While driving

on the island I noticed many stray dogs that were very lethargic and malnourished. Most individuals in the states castrate their pets and take them to the veterinarian annually for vaccinations. I have noticed that in Dominica very few people spay or neuter their dogs and even less vaccinate their dogs. Most don't even chain up or fence their dogs into a yard, therefore I saw many dogs wandering around that were pregnant or had a litter of puppies. While I was present on the island there was a low cost clinic through the humane society to spay or neuter your pet scheduled for the first week of June. I soon found out that it was cancelled due to low funding.

When I first contacted the Portsmouth Animal Health Center I spoke with the receptionist who informed me that the doctor was not in at the moment. She was then happy to give me his personal cell phone number. From personal experience from working at a veterinary clinic I was very surprised she supplied me with his cell phone number. In this particular case, if I had supplied just anyone who called the clinic with the doctor's cell phone I would most likely be written up or scorned. I quickly learned that he is the local veterinary and that is what he is there for to answer questions from anyone at anytime of day. At first I was hesitant to call his personal cell phone, but when I interviewed him he was more than happy to answer questions that I had for him.

In Dominica the people who are concerned about their pet or can afford the services take their pet in for annual vaccinations. The economy is not as well as the United States. Most people cannot spend what little money they have on their pet. They are more concerned with putting food on the table or supplying their children with clothes and are not concerned with the dog's health. Do not get me wrong, their priorities are in the right place. The cultures are just different in many ways. Most Americans can afford

such expenses as owning a pet and taking care of it properly, or what we know as taking care of the pet properly.

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