Controlling intestinal parasites from a public health perspective

Michael W. Dryden DVM, MS, PhD, DACVM (parasitology)
College of Veterinary Medicine – Kansas State University
Manhattan, KS

Introduction:
Preventive health care, including the prevention of common parasitic infections in cats and dogs, is an approach that is relatively easy to accomplish. Veterinarians and pet owners must realize that proper selection of parasiticide will not only prevent heartworms but also can prevent a variety of internal and external parasites. This approach has been advocated by the Companion Animal Parasite Council (CAPC; www.capcvet.org). CAPC recommends “year-round treatment with broad-spectrum heartworm anthelmintics that have activity against parasites with zoonotic potential.” The council also states: “Pet-owner awareness of heartworms and fleas can serve as the foundation for effective prevention and control of other parasites.” These recommendations should be adopted for both cats and dogs.

When beginning a parasite control program it is important to find the foundation parasite from which the success of the program hinges. The foundation parasite may be the most common, the most pathogenic or of the most concern to the client. The foundation parasite is the one disease that you and your clients recognize must be included in your parasite control program. Therefore the foundation parasite in dogs is often Heartworm, but in other areas other parasites such as ticks and the diseases they transmit may also resonate with pet owners. While cats are not as commonly afflicted with heartworms as dogs the increased awareness of the pathology and potentially deadly nature of heartworm disease in cats1,2 may allow D. immitis to rise to the forefront of concern with many clients. However, this author feels that fleas are often the foundation parasite for a parasite control program in cats.3 However, practitioners must use their knowledge and experience to choose the foundation parasite for cats and dogs in their area or even for an individual pet and client.

Next it is important to remember that while we might focus initially on prevention of a “foundation” parasite, we must stress to the pet owner that we are actually implementing a “broad-spectrum” parasite prevention package. Explain that not only will we be preventing heartworm disease in dogs, but we will also potentially be controlling fleas, ticks, lice, certain mites, and several common intestinal nematodes. In addition we will be reducing the chance that the pet dog could transmit a parasitic disease to them or other members of their family. Similarly in cats, we might tell them we will try to ensure that their cat and home does not become flea infested, but we will also be preventing their cat from becoming infected with ear mites, face mange, lice, intestinal nematodes and potentially deadly heartworm.

The program often begins with broad-spectrum heartworm medications that also prevent several common intestinal parasite infestations. Because prevention of heartworm in cats and dogs using macrodilides is well documented, this article will focus on the epidemiology and prevention of the other common parasites found in cats and dogs that can be controlled using monthly heartworm medications. Products currently approved in the United States and Canada are Advantage Multi (Bayer; imidacloprid–moxidectin, 10 mg/kg:1.0 mg/kg cats; 10 mg/kg:2.5 mg/kg dogs), Heartgard (Merial; oral ivermectin, 24 µg/kg dogs), Heartgard Plus for dogs (Merial; oral ivermectin:pyrantel pamoate, 6 µg/kg:5mg/kg (Also Iverheart brands),Interceptor (Novartis; oral milbemycin oxime, 2.0 mg/kg for cats; 0.5mg/kg dogs), Revolution (Pfizer; topical selamectin, 6 to 12 mg/kg) and Sentinel for dogs (Novartis; oral milbemycin oxime:fenbendazole, 0.5mg/kg:10mg/kg). These products can be used alone or in combination with other drugs and insecticides to prevent a variety of canine and feline parasites.

Internal Parasites
Many pet owners do not want to think their cat or dog, a member of their family, may have preyed on a mouse, bird or other animal. However, this natural predator–prey relationship is a common mode of transmission of many feline parasites, including Alaria spp., Ancylostoma tubaeforme, Cystoisospora spp. (Isospora) (Physaloptera spp., Sarcozystis spp., Taenia taeniaeformis, Toxocara cati, Toxascaris leonina, and Toxoplasma gondii). Similarly many parasites of dogs can be acquired through predation, including Alaria spp., Cystoisospora spp. (Isospora), Physaloptera spp., Sarcozystis spp., Taenia spp., Toxocara canis, and Toxascaris leonina.4,5

Toxocara spp.
Predation on infected paratenic hosts is commonly underestimated by veterinarians and likely completely unknown by most pet owners as a mode of Toxocara spp. transmission. Larvae commonly become encysted in the tissues of chickens, cockroaches, earthworms, and mice when they ingest infective larvated eggs in feces or contaminated soil. Similarly children may also become infected with somatic tissue stages of T. cati or T. canis, which can cause visceral or ocular larva migrans. In addition cats and dogs become infected after ingesting larvated eggs.

Three of the broad-spectrum heartworm medications currently approved for use in cats are effective in eliminating T. cati or T. canis, which can cause visceral or ocular larva migrans. In addition cats and dogs become infected after ingesting larvated eggs.

Several of the broad-spectrum heartworm medications that are currently approved for use in dogs are effective for the elimination of T. canis including the imidacloprid–moxidectin topical formulation,6 the oral ivermectin/pyrantel pamoate formulation,7 oral milbemycin oxime,8 and the oral milbemycin oxime/lufenuron formulation.9 In addition the oral ivermectin/pyrantel pamoate, the topical imidacloprid–moxidectin and the oral milbemycin formulations are also labeled for Toxascaris leonina.

Ancylostoma sp.
In cats larvae may be ingested, the skin or roidents with encysted larvae may serve as paratenic hosts, but there is no evidence for either transmammary or transplacental transmission of A. tubaeforme in cats.10 All of the broad-spectrum heartworm medications approved for use in cats in the U.S. and Canada are effective in eliminating A. tubaeforme.9,14,15 Similarly A. caninum which is an important parasitic disease in dogs and a potentially life threatening disease in puppies following transmammary transmission, can be effectively managed with several of the broad-spectrum heartworm medications including the imidacloprid–moxidectin topical formulation,10 the oral ivermectin/pyrantel pamoate formulation,17 oral milbemycin oxime,18 and the oral milbemycin oxime/lufenuron formulation.

It should be remembered that when these formulations are administered as approved, the dog or cat is essentially “dewormed” on a monthly basis. If a pet is frequently exposed to infective third-stage larvae of Ancylostoma sp, the worms can mature and deposit eggs between monthly applications, given that the prepatent period of Ancylostoma sp, can be as short as 2 to 3 weeks. However, monthly application should prevent development of hookworm disease. Uncinaria sp, a mildly pathogenic hookworm species can be controlled by the administration of broad-spectrum heartworm medications that contain milbemycin, moxidectin or pyrantel.
Trichuris vulpis

*Trichuris vulpis* is a pathogenic parasite of dogs that can produce mild to severe blooding diarrhea and chronic debilitation. This parasitic disease can be controlled by the monthly administration of broad-spectrum heartworm medications that contain milbemycin and the imidacloprid/moxidectin formulation also label claims against whipworms.

Overview of Internal Parasite Prevention

Several broad-spectrum heartworm medications are effective in controlling *Toxocara spp.* and *Ankylostoma spp.* but cats and dogs may become infected with a variety of internal parasites against which these formulations may not be effective. Therefore, fecal examinations utilizing a centrifugal procedure should be performed two to four times during the first year of the pet’s life and one to two times annually as an adult depending on the pet’s health and lifestyle factors (www.capcvet.org). In addition for pet health and to minimize egg shedding kittens should be given biweekly anthelmintic treatments beginning at 3 weeks of age. When cats reach 8 or 9 weeks of age, they can be put on a monthly broad-spectrum heartworm medication. Puppies should be administered anthelmintic treatments at 2, 4, 6, 8, and 10 weeks post-partum. Then they can be placed on a monthly broad-spectrum heartworm medication.

Historically, many veterinarians and pet owners attempted to administer broad-spectrum heartworm medications seasonally. Although seasonal prevention of heartworm and other parasites may at seem appropriate in many regions of North America, it is actually difficult to accomplish. Veterinarians must first attempt to estimate heartworm larvae development rates in mosquitoes so they can seasonally time the administration of heartworm preventives. Then they are faced with the difficulty if not impossibility of attempting to estimate the rate of flea development, tick questing patterns, mite and louse transmission, and development of infective roundworm eggs and hookworm larvae. Because of differences in the biologic requirements of each parasite, the specific transmission “seasons” vary among parasites. Changing climatic conditions from one year to the next can have marked effects on parasite “seasonality.”

Studies have not been published comparing the effectiveness of year-round versus seasonally timed prevention programs, but it is this author’s experience that determining when to start and stop seasonally timed applications of broad-spectrum parasite prevention programs is difficult. Considering the various and changing climatic epidemiologic factors and historic poor pet owner compliance it is understandable why the CAPC recommends year-round treatment with broad-spectrum heartworm medications (www.capcvet.org)

References