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Preface xi

David S. Lindsay and Anne M. Zajac

The Biology and Control of Giardia spp and Tritrichomonas foetus 993
Patricia A. Payne and Marjory Artzer

The biology and control of Giardia spp in dogs and cats, and Tritrichomonas foetus in cats is reviewed, including nomenclature, morphology, life cycle, epidemiology, pathogenic process, clinical signs, diagnosis, treatment and control, and public health aspects. These surprisingly similar protozoan pathogens are both clinically significant in veterinary clinical medicine.

Toxoplasmosis and Other Intestinal Coccidial Infections in Cats and Dogs 1009
J.P. Dubey, David S. Lindsay, and Michael R. Lappin

Toxoplasma gondii and related coccidians are intracellular protozoan parasites. Coccidia are obligate intracellular parasites normally found in the intestinal tract. Virtually all warm blooded animals, including humans are commonly infected with coccidians. This article reviews the diagnosis, treatment, and prevention of infections in cats and dogs related to Isospora spp, Toxoplasma gondii, and Neospora caninum. Much remains to be learned concerning the pathogenesis of clinical coccidiosis.

Canine Hepatozoonosis and Babesiosis, and Feline Cytauxzoonosis 1035
Patricia J. Holman and Karen F. Snowden

The apicomplexan protozoans of the genera Hepatozoon, Babesia, and Cytauxzoon are emerging parasite pathogens that are increasingly diagnosed in the pet population. These tick-transmitted apicomplexan parasites are becoming more widely recognized as serious canine or feline pathogens. This article reviews the epidemiology, diagnosis, treatment, and control of canine hepatozoonosis and babesiosis, and feline cytauxzoonosis.

Canine Chagas’ Disease (American Trypanosomiasis) in North America 1055
Stephen C. Barr

Chagas’ disease, or American trypanosomiasis, caused by the hemoflagellated protozoan Trypanosoma cruzi (class Zoomastigophorea and family Trypanosomatidae), is the leading cause of dilated cardiomyopathy in man. In dogs in North America, Chagas disease mainly occurs in working dogs in southeastern Texas. It is likely that most dogs become infected by
eating infected vectors, causing the release of the organisms into the mouth of the host. Most dogs are diagnosed during the chronic stage of the disease, which is typified by dilated cardiomyopathy and malignant ventricular-based arrhythmias. This article reviews the etiology, epidemiology, pathogenesis, diagnosis, and available therapy for Chagas’ disease in dogs.

Canine Leishmaniasis in North America: Emerging or Newly Recognized? 1065
Christine A. Petersen and Stephen C. Barr

Canine leishmaniasis is a fatal zoonotic visceralizing disease usually associated with tropical areas. The etiologic agent is an obligate intracellular protozoan, *Leishmania infantum*. In 1999, an outbreak of a canine leishmaniasis was reported in a Foxhound kennel in New York, and since that report, several other outbreaks have occurred across the United States in additional Foxhound kennels. Because of the high mortality and transmissibility associated with these outbreaks, it is essential that clinicians be aware of this disease to permit its rapid recognition and institution of control measures. Cases with a travel history may suggest imported disease; these are mainly observed from Southern Europe (eg, south of France, Spain, and Italy). Breeds from these and other endemic areas may be at higher risk of infection with *Leishmania* because of vertical transmission. The purpose of this report is to discuss the clinical signs, epidemiology, diagnosis, control, and treatment of canine leishmaniasis with focus on the aspects of this disease within North America.

Cestodes of Dogs and Cats in North America 1075
Gary Conboy

Cestodes are hermaphroditic flatworms (tapeworms) consisting of a scolex, neck region, and repeating segments. Cestodes lack a mouth, intestine, and body cavity. Life cycles are indirect, with the definitive host acquiring the adult form of the tapeworm by the ingestion of the larval metacestode stage contained in an intermediate host. This article describes the cyclophyllidean and pseudophyllidean groups of infective cestodes. Tapeworm infection is common in dogs and cats in North America. Infection rarely results in clinical disease, but animals infected with tapeworms should be treated. Echinococcosis, though infrequently diagnosed, remains a serious human health threat in North America.

Intestinal Nematodes: Biology and Control 1091
Christian Epe

A variety of nematodes occur in dogs and cats. Several nematode species inhabit the small and large intestines. Important species that live in the small intestine are roundworms of the genus *Toxocara* (*T canis*, *T cati*) and *Toxascaris* (ie, *T leonina*), and hookworms of the genus *Ancylostoma* (*A caninum*, *A braziliense*, *A tubaeforme*) or *Uncinaria* (*U stenocephala*). Parasites of the large intestine are nematodes of the genus *Trichuris* (ie, whipworms, *T vulpis*). After a comprehensive description of their life cycle
and biology, which are indispensable for understanding and justifying their control, current recommendations for nematode control are presented and discussed thereafter.

Helminth Parasites of the Canine and Feline Respiratory Tract 1 109
Gary Conboy

Helminth parasite infection of the canine and feline respiratory tract is uncommon in North America. This article reviews the prevalence, etiology, diagnosis, and treatment of helminth parasite infections in dogs and cats. The diagnosis of parasitic infections caused by helminth parasites of the respiratory tract of cats and dogs is infrequent in most parts of North America. Several fecal examination methods used in the diagnosis of helminthic infections are discussed in this article.

Heartworm Biology, Treatment, and Control 1127
Dwight D. Bowman and Clarke E. Atkins

This article is a review of the systematics, taxonomy, biology, prevention, control, and treatment of the canine heartworm, *Dirofilaria immitus*. This filarioid parasite remains one of the most important and dangerous diseases of the dog throughout the United States. The geographic range of the parasite is expanding, and in many parts of the country it has emerged as a threat to canine welfare only in the last 50 or so years. The article also discusses the pathophysiological mechanisms behind the disease induced, the means for diagnosing the disease, and the means of assessing the success of therapy. The treatment of potential complications of heartworm infection, such as post-adulticide thromboembolism, eosinophilic granulomatous pneumonitis, and caval syndrome, is also discussed.

Mites and Lice: Biology and Control 1159
Robert G. Arther

Dogs and cats frequently encounter a diverse variety of mite and lice species, which may result in mild to severe consequences depending on husbandry conditions, the severity of the infestation, and the nature of the localized or systemic defense mechanisms mobilized by the host in response to the parasite. Some of these external parasites are obvious to detect, identify, and control, although others may offer a significant challenge to the practitioner. Traditional acaricide and insecticide formulations, including dips, sprays, powders, and shampoos, have been used to treat and control these infestations. Some of the more recently developed, low-volume, topically applied insecticides and systemically acting macrolide formulations, although not always labeled for specific claims, may offer safe, efficacious, and convenient alternatives. The practitioner may wish to consider these products when implementing treatment and control programs involving these pests.
Flea and tick infestations are common and elimination can be expensive and time consuming. Many advances in control of fleas can be directly linked to improved knowledge of the intricacies of flea host associations, reproduction, and survival in the premises. Understanding tick biology and ecology is far more difficult than with fleas, because North America can have up to 9 different tick species infesting cats and dogs compared to 1 primary flea species. Effective tick control is more difficult to achieve than effective flea control, because of the abundance of potential alternative hosts in the tick life cycle. Many effective host-targeted tick control agents exist, several of which also possess activity against adult or immature fleas and other parasites.