

# Chronic Intestinal Diseses in Dogs: A Systematic Approach Always Pays Off...

Frédéric P. Gaschen, DVM, DACVIM  
Louisiana State University  
Baton Rouge, LA

Chronic diarrhea in dogs can be a frustrating problem for owners and veterinarians alike. Frequent causes include intestinal parasites (nematodes and protozoa), adverse food reactions, antibiotic responsive diarrhea and inflammatory bowel disease. A systematic approach based on simple diagnostic tests and treatment trials is recommended for most dogs, while severely ill dogs benefit from a more aggressive diagnostic approach. A good collaboration between veterinarian and dog's owner is required for successful treatment. However, particularly in cases of IBD, treatment protocols may deliver frustrating results.

## Objectives of the presentation

- To review the main causes of chronic enteropathies in dogs
- To describe a simple and logical systematic approach that will be appropriate for most dogs presented with chronic diarrhea

## Causes of chronic diarrhea in the dog

The causes of chronic diarrhea in dogs are multiple, numerous factors are involved, and the prevalence of different diseases can vary depending on the geographical location. Some diseases can generally be ruled out using relatively simple exams (e.g. intestinal parasites). However, the diagnostic approach other diseases may require therapeutic trials (e.g. adverse reaction to food) or more detailed investigations. In severely sick animals (with obvious systemic signs), it is preferable to immediately adopt a more aggressive, global approach involving blood tests, diagnostic imaging, and possible endoscopy or laparotomy with sampling of mucosal biopsies.

## Diagnostic approach

Parasite infestation must be ruled out. Fecal shedding of parasite ova or oocysts is not continuous, and a single negative parasitological result does not allow concluding that no parasites are present in the digestive tract. Moreover, several parasites may be difficult to detect (e.g. *Giardia* spp. are easier to diagnose using fecal ELISA than classical parasitological analysis). A «practical» alternative to multiple fecal exams consists in systematically administering a broad spectrum anthelmintic drug to treat locally prevalent endoparasites (e.g. fenbendazole 50 mg/kg p.o. daily during 3-5 days).

Diet: when parasites have been ruled out, dietary problems are probably the most frequent cause of chronic diarrhea in dogs. Food can elicit gastrointestinal inflammation in several ways: in genuine food allergy an immunological reaction against one or several of the dietary components (allergen) is at the origin of the problem. Food intolerance is a more frequent cause of chronic diarrhea than food allergy. It is due to a non-immunological reaction against one or several components of the diet. It could be caused by the inability to adequately digest some of the dietary components or possibly by substances added to the diet during industrial food processing.

Dogs with food allergy and dermatologic clinical signs are often young (in several studies between one third and one half of the cases were one year of age or less). Similarly, the average age of dogs with chronic enteropathy who responded to an elimination diet was lower than that of dogs with IBD requiring immunosuppressive therapy (3.5 vs. 7.5 years old). A breed predisposition has been identified in the Soft Coated Wheaten Terrier which develops a food allergy with protein-losing enteropathy. Furthermore, in Switzerland, the breeds West Highland White Terrier, Pug, Boxer and Rhodesian Ridgeback were overrepresented among the affected dogs with adverse reactions to foods with dermatological problems. However, the heritability of canine food allergy has not been clearly demonstrated.

Consequently, a strict elimination trial is recommended in all dogs that have not responded to anti-parasitic treatment. In the author's experience 7 to 10 days are sufficient in most cases for an improvement in stool quality and clinical status. Many commercial diets are available for elimination trials. They are based on proteins from an original source to which the dog had no prior exposure, or on hydrolyzed peptides. Once the clinical signs of diarrhea have resolved, it is advisable to maintain the strict regime to prevent unpleasant relapses. To confirm the diagnosis of food allergy and find out what exactly the dog is allergic to, it is necessary to perform a dietary challenge with different allergens which were part of the original diet (e.g. beef, chicken, milk, etc.) and to wait for the recurrence of clinical signs.

Antibiotic-responsive diarrhea (ARD) – In the 1990's prolonged use of oxytetracycline was recommended in cases of small intestinal bacterial overgrowth (SIBO), particularly among German shepherds and SharPeis. The existence of this syndrome has since been called into question, and the preferred term is now ARD. What are the reasons for the success of antibiotic treatment in such cases? All antibiotics administered orally lead to a qualitative and quantitative change of the intestinal flora, and indirectly affect the

mucosal disease. In addition, tetracyclines have chelating properties against specific pro-inflammatory molecules. Metronidazole is an antimicrobial agent with multiple effects: at a high dose (25 mg / kg p.o. BID for 5-10 days) it is efficient against *Giardia intestinalis*. At a reduced dose (10-15 mg /kg p.o. BID) it kills many anaerobic bacteria and probably modulates cellular immunity in the intestinal mucosa. Tylosin (20 mg /kg p.o. q12 to 24 h) is a macrolide antibiotic that has proved useful in several cases of recurrent and chronic intestinal diseases that were refractory to other antibiotics and prednisolone. Moreover, tylosin exerts inhibitory effects on innate immunity.

Even though antimicrobials are often used in dogs with chronic intestinal diseases, true bacterial enteric infections remain rare. Fecal culture can be useful if specific bacteria are suspected (e.g. *Campylobacter* spp.), but can be difficult to interpret because numerous healthy dogs harbor enteropathogenic bacteria in their intestine. Moreover, it may be difficult to establish if the identified bacteria are the actual cause of the problem, or just opportunists benefitting from the changes in intestinal flora associated with chronic intestinal diseases. The therapeutic approach of the dog excreting *Campylobacter* depends on the animal's health status (healthy or showing gastro-intestinal signs) and its contact with immune-compromised humans or very young children. Erythromycin or fluoroquinolones at usual doses are usually efficacious.

What to do if the proposed systematic approach fails? In cases of predominantly large bowel diarrhea (colitis with typical clinical presentation), a therapeutic trial can be initiated with metronidazole (10-15 mg/kg p.o. BID during 5-10 days or sulfasalazine 10-25 mg/kg BID to TID for 2 weeks - beware of keratoconjunctivitis sicca), and addition of fiber to the diet (e.g. psyllium at 0.5 tablespoon (T) with each meal for toy breeds, 1 T for small dogs, 2 T for medium dogs, and 3T for large dogs).

However, especially in dogs with systemic signs, a more detailed approach is required. Following a thorough physical exam, a CBC and chemistry profile including usual parameters such as serum albumin and globulins as well as a urinalysis. Exocrine pancreatic insufficiency (EPI) is characterized by the triad voracious appetite/cachexia/steatorrhea, and should be ruled out prior to further GI testing. Serum trypsin-like immunoreactivity (TLI) should be determined in suspect cases.

### **Inflammatory bowel disease (IBD)**

IBD is a term borrowed from human medicine, although canine diseases have little in common with human IBD. In canine medicine this term encompasses diseases of unknown cause at the origin of chronic enteropathies. These enteropathies are further defined by their histological appearance (infiltration with lymphocytes and plasma cells, eosinophils, neutrophils or granulomatous appearance). A suspect diagnosis is made after identifiable causes of chronic enteropathies have been ruled out (see above). Confirmation relies on documentation of histologic infiltration associated with abnormal mucosal architecture

Specific tests of interest in dogs with chronic diarrhea and suspect IBD: serum albumin may be mildly to moderately decreased with many intestinal diseases with involvement of the small intestine. However, severe decreases (< 2 g/dL) are usually associated with protein-losing enteropathy, and the serum globulin concentration is generally equally decreased (panhypoproteinemia). Possible causes of intestinal protein loss include IBD or lymphangiectasia. Patients with severe hypoproteinemia are usually severely affected and may be presented with ascites, hydrothorax, and/or subcutaneous edema. They usually require more aggressive and intensive treatment. Hypoalbuminemia has been identified as a risk factor for unfavorable outcome in dogs with chronic enteropathies. Fecal alpha1-proteinase inhibitor can be a useful early marker of intestinal protein loss (performed at Texas A&M GI laboratory). In patients with protein-losing enteropathy, it may also be used for monitoring the evolution of disease and/or assess response to treatment. Rectal cytology is a simple test that may be very useful for the diagnosis of intestinal infections (especially fungal infections). Low serum cobalamine (vitamin B12) and/or folate concentrations may indicate severe dysfunction of the ileal and jejunal mucosa, respectively. Cobalamine supplementation has been demonstrated to be beneficial in hypocobalaminemic cats and dogs with intestinal diseases. Hypocobalaminemia was identified as a risk factor for poor outcome in dogs with chronic enteropathies, and parenteral supplementation is recommended. Vitamin B12 is administered SC (table 1). Serum cobalamin levels should be rechecked monthly to guide treatment.

**Table 1: recommended doses for SC vitamin B12 therapy in hypocobalaminemic dogs.**

Body weight	Dose (weekly for 6 weeks, then every other week for 6 weeks, then monthly – periodically recheck serum cobalamin concentrations)
Up to 5 kg	250 µg
5-15kg	400 µg
15-30 kg	800 µg
30-45 kg	1,200 µg
>45 kg	1,500 µg

Although abdominal radiographs are usually of little use, ultrasonography allows evaluation of the abdominal organs, particularly wall thickness and layering in different intestinal segments. Finally, endoscopic or surgical sampling of intestinal mucosal biopsies remains very useful, especially in severely affected dogs.

The therapeutic approach of IBD focuses on 2 main elements: dietary and drug therapy. The importance of the elimination diet was discussed above. However, in dogs with severe systemic signs (e.g. small intestinal diarrhea, significant protein loss) a highly digestible food diet with low fat content may be preferable at least initially. Medical treatment protocols for canine IBD most often involve the use of immunosuppressive doses of corticosteroids for several weeks followed by slow tapering to reduce the intestinal mucosal inflammation and achieve clinical remission. The author recommends using up to 2 mg/kg BID predniso(lo)ne p.o. for a few days, followed by 10-14 days at 1 mg/kg BID. Once the diarrhea is resolved, the dose is progressively decreased by one third to one half every 10-14 days. Dogs are usually switched to alternate day therapy after 4 to 6 weeks of treatment. This slow tapering is continued for weeks to months.

However, a number of dogs treated with immune suppressive doses of corticosteroids will either not respond at all or will relapse after weeks to months of treatment. At high dosages, corticosteroids have numerous side-effects such as PU-PD which may become unbearable for the owners, especially in large breed dogs. In patients that require prolonged therapy but are sensitive to its side-effects, the more expensive drug budesonide has been used with good anecdotal success (3.0 mg/m<sup>2</sup>, resp. 0.5-3.0 mg per dog, depending on body weight, once daily or every other day). In humans, budesonide undergoes a first pass hepatic extraction of approximately 80-90%. Therefore, only a fraction of the absorbed compound reaches the systemic circulation, theoretically decreasing the systemic side-effects. It has been documented that budesonide suppresses the hypothalamic-pituitary-adrenal axis in dogs with IBD, and the extent of the first pass effect is unknown. In refractory cases, the use of other immunosuppressive substances may be beneficial (e.g. azathioprine 1-2 mg/kg daily for 2 weeks, then every other day) but is associated with risks of myelosuppression (regularly check leucocyte count). Finally, cyclosporine A has been effective in a series of dogs that had been refractory to other treatments (5 mg/kg PO once daily).

#### **References & suggested reading**

- Allenspach K, Wieland B, Gröne A, et al. Chronic enteropathies in dogs: evaluation of risk factors for negative outcome. *J Vet Intern Med.* 2007; 21(4):700-8.
- Westermarck E, Skrzypczak T, Harmoinen J, et al. Tylosin-responsive chronic diarrhea in dogs. *J Vet Intern Med.* 2005;19(2):177-86.
- Westermarck E. Evaluation of the patients with chronic diarrhea. In Steiner J ed. *Small Animal Gastroenterology.* Hannover. Schlütersche, 2008; 127-133
- Willard MD. Diarrhea. In Ettinger SJ and Feldman EC ed. *Textbook of Veterinary Internal Medicine.* St. Louis. Saunders Elsevier, 2010; 201-203