

# Large Bowel Diarrhea – Canine

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## Definition

*Diarrhea* is defined as an increase in the water content, frequency, or volume of feces. *Large bowel diarrhea*, however, is classically noted to be associated with increased tenesmus or urgency with defecation, increased frequency of defecation of usually smaller volumes, and hematochezia or increased mucus may be present. These characteristics serve to differentiate large bowel diarrhea from small bowel diarrhea. Large bowel diarrhea can also be characterized by cause: infectious (clostridial colitis), parasitic (whipworm colitis), dietary (fiber-responsive colitis), inflammatory (lymphoplasmacytic colitis or inflammatory bowel disease [IBD]), and neoplasia. Conditions causing large bowel diarrhea often are associated with inflammation and thus are termed *colitis*.

## Key Diagnostic Tools and Measures

Diagnosis of large bowel diarrhea begins with a complete history, including dietary history and drug therapy, and physical examination, including rectal examination. Fecal stream analysis (e.g., fecal flotation, cytology, enzyme-linked immunosorbent assay [ELISA]/polymerase chain reaction [PCR] analysis) or therapeutic deworming is very important; whipworms are especially difficult to find and are important causes of signs of colitis. In acute large bowel diarrhea: symptomatic or supportive therapy is often all that is needed (e.g., added dietary fiber, probiotics, deworming, or possibly motility modifiers). In dogs with chronic (>2 weeks) large bowel diarrhea where symptomatic or supportive therapy is not effective in controlling the clinical signs, imaging (radiographs or ultrasound), more specific tests for gastrointestinal (GI) parasites or bacteria, or endoscopy (with biopsy) are indicated.

## Pathophysiology

The clinical signs of large bowel diarrhea are a reflection of proximity of the disease to the end of the GI tract. As a result the clinical signs of colon diseases are all quite similar, while their inciting causes may be quite different. For example, hematochezia occurs instead of melena because the blood is not in the tract long enough to be digested by bacteria or enzymes, increased mucus is often present in the feces due to the increased number of mucus-secreting glands in the colon which increase their production when the epithelium is disrupted, and increased straining or frequency of defecation occurs due to disrupted colonic motility reducing the storage time for feces to form normal-sized, reduced-water feces. Thus, while large bowel diarrhea can occur in dogs due to a large variety of inciting causes, the response to the disruption of the mucosa in the colon, regardless of cause, is essentially the same.

## Signalment

Acute large bowel diarrhea is more common in young or middle-aged dogs due to the increased risk of dietary indiscretion, parasitic infection, or infectious causes such as clostridial colitis from dietary changes or boarding. Small breeds of dogs may be at a greater risk of developing stress colitis or irritable bowel syndrome, although this condition can occur in any breed. Chronic large bowel diarrhea is most common in middle-aged or older dogs and may occur in any breed due to a variety of dietary, inflammatory, or neoplastic causes including colonic IBD or various forms of colon cancer. Boxer dogs have an increased incidence of histiocytic ulcerative colitis (HUC), a specific type of antibiotic-responsive IBD due to bacterial overgrowth in this breed.

## Key Nutrient Modifications

The most important dietary modifications in dogs with large bowel diarrhea are to provide highly digestible nutrients so that excess carbohydrates, fat, and protein do not reach the colon undigested, and second, to modify (increase) the amount and type of dietary fibers and prebiotics to maximize colonic epithelial and bacterial health.

The goal for providing a diet with highly digestible nutrients (>85–90% digestible) is to maximize digestion and absorption of carbohydrates and fats in the small bowel to prevent an exacerbation of large bowel diarrhea due to bacterial disruption or the osmotic effects of maldigestion of carbohydrates (CHO). As a result, ideal diets for large bowel diarrhea should contain moderate amounts of highly digestible CHO sources and moderate to low amounts of fat. Cooked white or blended rice or potatoes are often ideal CHO sources for dogs with intestinal disease because they are highly digestible and do contain gluten or other potential sources of antigenic stimulation. Other gluten-free CHO sources are tapioca and corn, but they are slightly less digestible than rice, and corn may cause hypersensitivities in some dogs.

Protein becomes a concern when diarrhea is suspected due to a food allergy. Most dogs with food allergy have both large and small bowel diarrhea, vomiting, or cutaneous manifestations of allergic disease. The key to successful management of dogs with diarrhea due to food allergy is identifying a novel protein source (or one that is less antigenic, such as a hydrolyzed protein diet).

In some dogs with large bowel diarrhea, the single most important dietary modification may be the addition of dietary fiber to the diet. Dietary fibers are complex carbohydrates primarily from plant sources that are not easily digested by mammalian digestive enzymes. Digestion of these foods is accomplished by the help of bacteria in the GI tract, and most efficiently occurs in the colon of dogs. Because different types of dietary fiber are digested (also called *solubility* or *fermentability*) more or less efficiently by bacteria, they have often been classified by this characteristic. It is important to realize, however, that many dietary fibers have characteristics of both groups and thus are termed *mixed fiber*.

Soluble (or highly fermentable) fiber sources are beneficial in dogs with colonic disease because they are broken down into short-chain fatty acids (an essential nutrient source for colonocytes) and also serve as a nutrient source for beneficial bacteria (also known as a *prebiotic*). Addition of soluble fiber sources has been shown to increase the numbers of beneficial bacteria and reduce pathogenic bacteria, a key issue when disruption of the normal environment occurs, no matter what the inciting cause. Soluble fiber sources cannot be added in large amounts, however, as they are highly fermentable and will cause increased flatus and fecal water content.

Insoluble (or poorly fermentable) fiber sources are also beneficial in dogs with colonic disease, but for very different reasons. Insoluble fibers increase fecal bulk and, as a result of the stretching and distention, improve motility (both normal segmentation as well as propulsion) in the colon. The result of adding insoluble fiber to diets is to decrease frequency and straining associated with aberrant motility in colitis; the disadvantage is that they do not provide a nutrient source for fecal bacteria or colonocytes, which is important in dogs with severe diseases of the colon.

## Recommended Ranges of Key Nutrients

Nutrient	% DM	g/100 kcal	% DM	g/100 kcal
	Recommended dietary level		Minimum dietary requirement*	
Crude fiber <sup>#</sup>	7–16	2.0–5.0	n/a	n/a
Fat	10–15	3–5	5	1.4

Modified intake of these nutrients may help address metabolic alterations induced by disease states. The recommended dietary composition is shown as percent of dietary dry matter (DM) and as g or mg per 100 kcal metabolizable energy. All other essential nutrients should meet normal requirements adjusted for life stage, lifestyle and energy intake. \*Nutrient requirement for adult animals as determined by the Association of American Feed Control Officials

<sup>#</sup>Sources should include both soluble and insoluble fibers. The crude fiber analysis includes most insoluble fibers, but does not include soluble fibers. Therefore, crude fiber has limited usefulness when evaluating the total fiber content of foods. The ingredient list should be evaluated for sources of soluble fiber.

## Therapeutic Feeding Principles

- Key nutrients should be highly digestible (>90% digestibility) to minimize osmotic diarrhea, bacterial fermentation of undigested foods, and reduce intestinal gas.
  - Use a high-quality, single-source hydrolyzed protein if IBD or food sensitivity is likely, but in most cases of colitis this is not necessary.
  - Moderate to increased amounts of insoluble fiber are indicated to improve colonic motility, unless constipation or colonic obstruction occurs due to cancer or stricture.
  - Addition of a mixed or soluble fiber source is indicated to improve colonic epithelial cell health and normalize bacterial populations disrupted by disease or therapy. The optimum ratio of soluble and insoluble fibers in diets for colon disease is debated; however, addition of both fiber sources is generally accepted to be ideal.
  - Increased omega-3 fatty acids to help reduce eicosanoids associated with intestinal inflammation.
  - Moderate levels of dietary fat (should be high digestible).
  - Probiotic supplement to restore microflora balance.
- **Treats** – In general, treats should be avoided in dogs with intestinal disease until a definitive diagnosis is made. If treats are important for the dog's daily routine, treats made using the therapeutic diet or based on the principles above can be given.

■ **Tips for Increasing Palatability** – If the dog will not eat the suggested diet, a small amount of low-sodium chicken broth can be added to the food. Alternatively, a small amount of the canned version of the dry food can be mixed with the food to increase interest. If the dog refuses to consume the therapeutic diet, a mixed-fiber source such as psyllium mucocolloid (Metamucil®, Proctor & Gamble) can be added to the dog's usual diet.

■ **Diet Recommendations** – Diets used for large bowel diarrheas can be one of two dietary types: 1) diets containing highly digestible ingredients as is typical of small bowel diarrhea, or 2) diets containing increased amounts of dietary fiber. Diets containing increased dietary fiber can be either primarily insoluble (bulking) fiber diets or mixed (both soluble and

insoluble) fiber diets. Addition of a probiotic nutritional supplement has been shown to be effective in restoring normal intestinal health and balance.

Several OTC diets are potentially suitable for dogs with large bowel diarrhea, as they contain increased amounts of insoluble fiber – these diets are typically classified as weight management diets. The individual diets may contain insoluble or mixed fiber sources, so the label must be evaluated to determine the fiber source.

## Client Education Points

- Feed only the recommended foods for the time recommended.
- It may be helpful to feed small amounts of the food more frequently—three to four times per day—because large amounts of food increase the workload of the GI tract and may contribute to clinical signs; however, this is not universally true for all dogs.
- Make sure plenty of water is available at all times; adding fiber to the diet may cause feces to become too dry and hard to pass in some dogs.
- Counsel owners on the effects of adding dietary fiber to the diet: insoluble fiber will increase fecal volume, while soluble fibers generally contribute to a softer, smaller stool, but may be associated with more flatus.

## Common Comorbidities

Conditions that commonly occur concurrently in dogs with large bowel diarrhea include colonic IBD and bacterial overgrowth, and clostridial colitis and recent boarding or diet change.

## Interacting Medical Management Strategies

Steroid therapy in IBD will increase thirst and appetite and may result in unintended weight gain or hepatopathy. Immunosuppressive therapy for IBD or lymphoma may result in GI toxicity (common clinical signs can be vomiting or diarrhea). Nonsteroidal anti-inflammatory therapy for colonic IBD (e.g., sulfasalazine) may result in sulfonamide toxicity (i.e., dry eye, liver or bone marrow disease, immune-mediated diseases such as immune-mediated thrombocytopenia, immune-mediated hemolytic anemia). Antibiotic therapy may disrupt the bacterial flora and cause worsening diarrhea due to bacterial overgrowth.

## Monitoring

Fecal composition should be assessed to determine whether normal stool character is returning or if new problems are developing. Assessment of clinical condition is important to be sure the dog is not dehydrated and is continuing to eat, with no new signs of illness (e.g., lethargy, weight loss, reduced or no appetite, or vomiting). If the dog is losing weight or becoming dehydrated, the treatment should be re-evaluated and adjusted to the needs of the particular patient.

See [Algorithm – Nutritional Management of Canine Large Bowel Diarrhea on page 51](#).