NUTRITION

Managing Chronic Enteropathies: Beyond Antimicrobials

***Laura Gaylord**, DVM, DACVIM (Nutrition), Whole Pet Provisions, PLLC, Fuquay Varina, North Carolina*
***Donna Raditic**, DVM, CVA, DACVIM (Nutrition), Nutrition and Integrative Medicine Consultants, Athens, Georgia*

Chronic enteropathy (or enterocolitis) is characterized by gastrointestinal signs (e.g., inappetence, vomiting, diarrhea, possible weight loss) that persist for longer than 2 to 3 weeks and may represent progression from acute gastrointestinal bouts managed with antimicrobial drugs.[1-4]

Chronic enteropathies have been previously classified as food responsive, antimicrobial responsive, and immunosuppressant responsive. These classifications may represent different forms of chronic enteropathy, but they may also overlap or be reflective of a continuum. Additional descriptive terminology includes fiber-responsive and nonresponsive enteropathy.[5-7] Regardless of the form of chronic enteropathy, primary management involves instituting a nutrition plan with an appropriate diet.[8,9]

CHRONIC ENTEROPATHY

Determining an appropriate treatment plan for chronic enteropathy relies on collecting a detailed history of clinical signs and diet, performing a thorough physical examination, and evaluating diagnostic findings. Taking a thorough diet history may reveal dietary indiscretions or feeding of inappropriate or unusual foods, treats, and/or pet supplements; the history may help with selection of a therapeutic diet or a trial of a diet that has not been previously fed. A close review of the medical history may help identify clinical signs that may have lasted longer than 2 to 3 weeks or are recurrent and episodic. Knowing the duration and severity of clinical signs will help determine whether supportive care is appropriate without an extensive workup or whether more intensive care and next-level diagnostic testing are required.

Abstract

Historically, the treatment for chronic enteropathy often included empiric use of antimicrobial drugs. It is now known that most dogs with chronic enteropathy have intestinal dysbiosis, a hallmark of the disease; therefore, the use of antimicrobials may perpetuate or even further the dysbiosis and clinical signs. The currently recommended treatment of chronic enteropathy in dogs is multimodal, with the first consideration being nutritional intervention.

Take-Home Points

- Empiric use of antimicrobials for dogs and cats with acute or chronic diarrhea has little scientific support, and most dogs treated with antimicrobials will relapse and undergo ongoing or recurrent antimicrobial use.
- Chronic enteropathy management is multimodal, involving nutrition, supplements (i.e., prebiotics, probiotics), and medical intervention.
- More than half of chronic enteropathies in dogs are food responsive, for which a diet change or a diet trial may be beneficial.
- Before starting a diet trial, clients should be informed that their dog must strictly eat only the food allowed and that repeat trials may be needed.
- For most patients, diet options will include therapeutic diets that are highly digestible, are gastroenteric, are high in fiber, contain novel or hydrolyzed protein, and have variable fat content.

Clinical signs of chronic enteropathy may include episodic bouts of inappetence, picky eating behavior, vomiting, diarrhea, and/or weight loss.[5] Additional signs may include regurgitation (possibly secondary to esophagitis from recurrent vomiting), flatulence, abdominal pain, hematemesis, tenesmus, hematochezia, melena, and/or constipation.[10,11]

Clinical signs will help localize the part of the gastrointestinal tract involved in the disease process (TABLE 1), which aids in identifying key nutrients of concern for diet selection as well as supportive management. Additional diagnostics may include repeating the minimum database (complete blood count, blood chemistry, urinalysis, possibly thyroid testing), imaging (radiography, abdominal ultrasonography), pancreatic enzyme testing (trypsin-like immunoreactivity, pancreatic lipase immunoreactivity), B vitamin status (cobalamin, folate), and adrenocorticotropic hormone (ACTH) stimulation testing. In the authors' clinical experience, when performing ACTH stimulation testing, it is most thorough and conclusive to add pre- and postaldosterone and even endogenous ACTH testing (go.navc.com/4crCR1x). Also indicated may be tissue biopsies obtained via endoscopy (upper and/or lower gastrointestinal) and/or exploratory surgery or laparoscopy.

Treatment Plans

Antimicrobial Use: Pros and Cons

For dogs experiencing acute or chronic diarrhea, antimicrobial therapy is often prescribed. However, empiric use of antimicrobials for dogs and cats with acute or chronic diarrhea has little scientific support. A recent study noted no improvement in outcomes of dogs receiving antimicrobials versus other supportive supplements.[12] Not only are current studies demonstrating little efficacy of empiric antimicrobial use, but they are detecting deleterious effects of antimicrobials on the gut microbiota. Use of metronidazole and tylosin for acute and chronic

TABLE 1 Small Versus Large Bowel Clinical Signs*

CLINICAL SIGN	SMALL BOWEL	LARGE BOWEL
Appetite	Normal or decreased	Normal
Weight loss	Common	Uncommon
Vomiting	Often present	Rarely present
Defecation frequency	Normal	Increased
Defecation urgency	Normal	Increased
Tenesmus	Absent	Present
Mucus in stool	Uncommon	May be present
Hematochezia	If present, dark/tarry color	If present, frank blood
Stool volume	Normal to increased	Normal to decreased

Adapted from: Schmid SM, Galloni AM. Hold that steroid! Diet trials for chronic enteropathy. Todays Vet Pract. *2022;12(3):26-31.*

diarrhea has been shown to lead to dysbiosis and persistent changes in microbiota richness and composition, which may predispose the patient to frequent relapses after treatment.[13,14] In addition, recent epidemiologic data for humans and dogs with infectious enteritis implicate exposure to antimicrobials as a risk factor for development of inflammatory bowel disease later in life for some patients.[15,16] Clients often expect antimicrobials to be prescribed for their dogs with gastrointestinal signs; therefore, it is important to explain the concerns associated with antimicrobial use (**BOX 1**).

For some patients, judicious use of antimicrobials may be appropriate. Antimicrobial therapy is recommended for dogs with parvovirus infection and should be considered for those with acute hemorrhagic diarrhea syndrome or immunocompromise (e.g., patients with cancer), all of which may display signs of bacterial translocation with subsequent sepsis (e.g., fever, neutropenia, hypoglycemia).[17,18]

As a result of accumulating data, antimicrobial use needs to be reconsidered and replaced by other treatments that do not harm the gut microbiota but rather support and possibly restore its functions. Some strategies are intended to manage clinical signs and address clients' concerns and frustrations with regard to dealing with clinical signs. Nutritional management, along with client education, can help address these client concerns.

BOX 1 Client Discussion Points

Why antibiotics are *not* prescribed for all patients with diarrhea*:

- Most cases of diarrhea are self-limiting and do not require antibiotic therapy.
- Antibiotics have potential side effects and should be used only when necessary.
- Antibiotics can cause or worsen diarrhea.
- Improper use of antibiotics may increase risk for resistant bacterial strains, making it harder to treat future infections.
- Antibiotics may have longer-lasting effects on the balance of bacteria within the gut, which can have negative health effects.

**"Antibiotics" is typically the more familiar term to use when speaking with clients versus antimicrobials.*

Multimodal Management

Diet Trials

Studies suggest that 50% to 66% or more of patients with chronic enteropathy have food-responsive chronic enteropathy; therefore, diet change or diet trials are diagnostic as well as therapeutic. For patients in stable condition, diet trials can be considered a first-line therapy.[19-21] All noncompliant food or flavored products must be eliminated (if the diet trial contains hydrolyzed or limited ingredients). For patients with food-responsive enteropathy, a strict diet trial may lead to clinical improvement within 2 to 3 weeks.[22,23] For some patients, multiple diet trials may be needed to determine the optimal diet that controls clinical signs. The optimal diet may be a commercial therapeutic diet or a properly formulated and balanced home-prepared diet.

Nutrient Profiles

Reviewing the nutrient profiles (i.e., protein, fat, digestible carbohydrate, and fiber) of the current diet and previous diets that did not resolve signs can help the practitioner select a new diet. In some cases, the commercial diet chosen or the formulated homemade recipe must accommodate more than a single desired feature (e.g., novel protein, fiber enrichment, and/or low fat) and must address the patient's current life stage (e.g., growth).

Unfortunately, there is no single nutrient profile recommended for all dogs with chronic enteropathy. Rather, diet selection for food trials is based on diet history, clinical signs, and location of bowel affected; the diet can be generally categorized as highly digestible/gastroenteric, high fiber, novel/hydrolyzed protein, and lower fat/ultra-low fat (**TABLE 2**). An initial trial on a highly digestible diet may be appropriate (**BOX 2**).

Client Education

In the authors' clinical experience managing dogs with chronic enteropathies, client education and setting appropriate expectations are paramount for successful management. Clients should be informed that clinical signs probably do not result from pathogenic bacteria and, therefore, instituting a regimen of antimicrobials is not usually indicated. Concerns associated with antimicrobial use should be reiterated. Providing clients with a treatment plan that is safe and prioritizing a

TABLE 2 Recommended Diet Trials[a]

CLINICAL SIGNS AND CONCURRENT DISEASES	DIET TRIAL #1	DIET TRIAL #2	DIET TRIAL #3
Small intestinal disease	Highly digestible, low-residue diet	First elimination diet[b]	Second elimination diet[b]
Large intestinal disease	Fiber-enriched diet	First elimination diet[b]	Second elimination diet[b]
Evidence of fat malabsorption (e.g., hypocholesterolemia, steatorrhea)	Low-fat diet (17–26 g/Mcal ME)	Low-fat elimination diet[b] (17–26 g/Mcal ME)	Ultra–low-fat nutritionist-balanced diet (<15 g/Mcal ME)
Dilated lacteals			
Concurrent dermatologic signs (e.g., pruritus, recurrent otitis externa)	First elimination diet[b]	Second elimination diet[b]	Third elimination diet[b]
Erythema			
Concurrent signs of delayed GI motility (e.g., vomiting, ileus, regurgitation)	Chosen diet should be low fat (17–26 g/Mcal ME)		
Concurrent pancreatitis			

Adapted from: Schmid SM, Galloni AM. Hold that steroid! Diet trials for chronic enteropathy. Todays Vet Pract. *2022;12(3):26-31.*
GI = gastrointestinal; ME = metabolizable energy.
[a]When selecting an initial elimination diet, it is recommended to begin with a hydrolyzed diet due to reported success with these varieties. Subsequent elimination diet trials should contain variable protein sources, fat content, and fiber content. The purpose of trialing 2 elimination diets is to conclude the disease is not diet responsive before initiating immunosuppressive therapy.
[b]Elimination diets include hydrolyzed diets, novel-protein diets, and home-prepared elimination diets.

TABLE 3 Management Options for Upper Gastrointestinal Signs of Chronic Enteropathies*

PRODUCTS	DOSAGE	NOTES
Slippery elm bark	To prepare as a paste: ▪ Mix 1–2 tsp of slippery elm powder with 100–300 mL (1 cup) of hot water until fully dissolved. ▪ Give 3–5 mL of mixture 2–3 times daily, ideally 30 minutes before a meal or medications/supplements. ▪ The mixture can be refrigerated for 3–4 days; warm to room temperature before feeding.	Natural mucilage and fiber. Helpful for managing gastric hyperacidity, gastritis, gastrointestinal upset, diarrhea, and constipation. Should be given 30–60 min before other medications, supplements, or foods to avoid interference with absorption.
ANTACIDS		
Famotidine	1 mg/kg q12h (round to nearest 5-mg increment)	For intermittent use
Omeprazole	0.5–1 mg/kg q12–24h (up to 2 mg/kg q12h)	For more extended (usually ≥1–2 weeks) use
COATING AGENTS		
Bismuth subsalicylate	▪ **Liquid:** 0.25–2 mL/kg q6–8h = 5 mL (1 tsp) per 10 lb q6–8h ▪ **Tablets (262 mg):** <11 lb, 1/4 tablet; 11.1–22 lb, 1/2 tablet; 22.1–55 lb, 1 tablet; >55 lb, 2 tablets; q12h	
Sucralfate (Carafate)	▪ **Cats and small dogs:** Empirically dosed 250 mg (1/4 tablet) PO q6-12h ▪ **Large dogs:** Empirically dosed 1000 mg (1 tablet) PO q6-12h	Crush tablet and give in a slurry with water
ANTINAUSEA MEDICATIONS		
Maropitant	1–2 mg/kg q24h	
Ondansetron	0.5–1 mg/kg q8–12h	

**Examples of upper gastrointestinal clinical signs of chronic enteropathies include licking, burping, regurgitation, and swallowing*

"first do no harm" approach may limit signs while also addressing clients' need to treat.

Before starting a diet trial, clients should be instructed that food trials must be strictly followed and that their pet is not allowed to eat unapproved treats, table foods, or snacks, including foodstuffs used to administer medications, toothpastes, supplements, and chews. Clients should also be informed that several diet trials are often needed before determining that a patient is

TABLE 4 Management Options for Diarrheal Signs of Chronic Enteropathies*

PRODUCTS	DOSAGE	NOTES
ABSORBENTS/ANTIDIARRHEALS		
Endosorb (PRN Pharmacal, prnpharmacal.com)	▪ **<25 lb:** 1 tablet up to q4h ▪ **>25 lb:** 2 tablets up to q4h	
Rx Clay (Rx Vitamins for Pets, rxvitamins.com)	1 scoop per 10 lb q12h	
FIBER SUPPLEMENTS		
Psyllium husk fiber powder	1–2 tsp per 20 lb q12–24h	
Powdered cellulose	▪ **Small dogs:** 1–2 grams q12–24h ▪ **Medium–large dogs:** 3–4 grams q12–24h	
Proviable paste (part of kit) (Nutramax, nutramaxlabs.com)	1–2 mL per 20 lb q8–12h	
Pumpkin (canned)	1/4 cup per 25 lb q12–24h	
Baby food (sweet potato/butternut squash)	2–3 tbs per 25 lb q12–24h	
PROBIOTICS		
FortiFlora (Purina Pro Plan, purina.com) Proviable DC (Nutramax, nutramaxlabs.com) Proviable Forte (Nutramax) Vetri Mega (VetriScience, vetriscience.com) Visbiome Vet (ExeGi Pharma, visbiomevet.com)	Dose as recommended per label for maintenance	▪ Start probiotic, preferably a single species (e.g., FortiFlora). ▪ Upscale probiotic to a multispecies/higher-potency product (e.g., Proviable DC, Proviable Forte, Vetri Mega). ▪ If necessary, implement the highest-potency, broad-spectrum probiotic available (e.g., Visbiome [human or veterinary]). ▪ During a flare, double the dose.
MOTILITY MODIFIERS		
Loperamide (liquid and caplets)	0.08 mg/kg q8h	▪ Reserve for urgency and watery diarrhea; not recommended in first 1–2 days. If not eating, sometimes 1–2 doses are helpful and sufficient to control/improve signs. ▪ No more than 3 doses in 24 hours or 3 days as it may cause constipation. ▪ Avoid use in dogs with the MDR1 mutation at the *ABCB1* gene because they are more sensitive to loperamide; there is no published evidence of a safe dosage for these patients.
APPETITE STIMULANTS		
Capromorelin	3 mg/kg q24h	
Mirtazapine	3.75–30 mg/dog q24h or 1.1–1.3 mg/kg q24h	

ABCB1 = TP-binding cassette sub-family B member 1; MDR1 = multidrug resistance 1.
**Examples of diarrheal signs of chronic enteropathies include mucus, blood, and a Purina fecal score >2–3/7 (purinainstitute.com/centresquare/nutritional-and-clinical-assessment/purina-fecal-scoring-chart)*

BOX 2 Examples of Highly Digestible Diets

Home-prepared options[a]
1 part cooked lean meat/protein + 2 parts cooked highly digestible, low-fiber carbohydrate

- **Lean meat/proteins (cooked):** chicken breast, turkey breast, boiled pork tenderloin, boiled lean ground beef (< 5% fat), whitefish (e.g., tilapia, cod), cottage cheese (1% or 2%)
- **Highly digestible, low-fiber carbohydrate (cooked):** white rice, pasta noodles, rice noodles, tapioca pearls/starch, white bread

Veterinary therapeutic diet options[b]

- Rayne Nutrition TheraDiet Growth/Sensitive-GI (dry, chunky stew), raynenutrition.com
- Blue Buffalo Natural Veterinary Diet GI Gastrointestinal Support or GI Gastrointestinal Support Low Fat (dry, canned), bluebuffalo.com
- Purina Pro Plan Veterinary Diet EN Gastroenteric, EN Gastroenteric Naturals, or EN Gastroenteric Low Fat (dry, canned), proplanvetdirect.com
- Royal Canin Veterinary Health Nutrition Gastrointestinal, Gastrointestinal Moderate Calorie, or Gastrointestinal Low Fat (dry, loaf), royalcanin.com
- Hill's Prescription Diet i/d Dog Food, i/d Low Fat Dog Food, or i/d Stress Dog Food (dry, stew, loaf), hillspet.com
- JustFoodForDogs Vet Support Rx Balanced Remedy or Hepatic Support Low Fat (fresh food diet), justfoodfordogs.com
- Nine and Line Therapeutic Diet Low Fat Digestive Care with Chicken or Kangaroo (fresh food diet), nineandline.com
- Wynwood Dog Food Company Digestive Support: Turkey + Rice (fresh food diet), wynwooddogfood.com

[a]For intermittent, supplemental use only; recipes are not balanced
[b]Fat and fiber content in products vary

not food responsive.[24] The benefits and limitations of each option (e.g., diet types used in feeding trials; a veterinary therapeutic diet; a balanced, properly formulated home-prepared diet) should also be discussed. Furthermore, clients should be informed that chronic enteropathy patients are often not cured but rather that a "successful outcome" for most patients is reduction in the frequency or severity of clinical signs.

Additional Strategies

A combination of nutritional, supplemental, and medical interventions is used to manage chronic enteropathy. Detailed descriptions and dosing are beyond the scope of this article, but suggestions are listed in **TABLES 3 AND 4**.

Despite appropriate diet management, clinical gastrointestinal signs may still occur. The authors explain to clients that these recurrences are termed "flares." Flares require building management plans with specific instructions and including guidelines for when it is necessary for the patient to be seen and treated by the veterinary team. The plan can outline supportive care similar to management of acute enteropathies, including a period of food reduction,[25,26] hydration support, and approved supplements or medications based on clinical signs. A sample plan with some tips for managing flares is provided in **BOX 3**. Successful management of flares involves ensuring that signs remain mild, can be controlled without hospitalization, and are of short duration to avoid progressive damage to the gut and microbiota. If flare episodes are rare and mild, changing the nutrition plan may not be indicated because overall the food plan has reduced the frequency and intensity of clinical signs and improved the patient's quality of life. For difficult cases, referral to an internal medicine specialist and a veterinary nutritionist may provide the next level of diagnostic testing and expertise for tailoring a specific management plan for patients with chronic enteropathy.

SUMMARY

In general, antimicrobial use for chronic enteropathy needs to be reconsidered and replaced by other supportive interventions that do not harm the gut microbiota. Current management strategies involve client education and nutrition plans supported by supplementation (e.g., absorbents, fiber, probiotics).

BOX 3
Scan the QR code for a client handout with tips for managing chronic enteropathy flares.

The best diet for any patient can be determined only by properly performed diet trials. To prevent progressive damage to the gastrointestinal tract and microbiota, proper management of flares needs to be explained to clients. TVP

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Donna Raditic

Dr. Raditic is a board-certified veterinary nutritionist. She is currently owner/founder of Nutrition and Integrative Medicine Consultants, which offers independent consulting and education. With a professional career that includes the roles of general practitioner/practice owner, academic, and independent veterinary nutritionist/consultant, she offers personal and unique perspectives on the role of nutrition, supplements, and integrative care for veterinary patients.

Laura Gaylord

Dr. Gaylord is a board-certified veterinary nutritionist, an independent consultant, and the owner/founder of Whole Pet Provisions, PLLC, a nutrition consulting company established in 2016 that offers veterinary nutrition consulting to pet owners, veterinarians, the pet food industry, and pet supplement companies. She offers homemade diet formulation and commercial diet consultations through her business for pet parents and their veterinary team.