

# Chronic Diarrhea in Dogs and Cats: A Practical Diagnostic Approach

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Chronic diarrhea is a common problem in dogs and cats. Diagnosis can be difficult and challenging for veterinarians due to the large number of possible causes of chronic diarrhea. Following a logical and thorough diagnostic plan is essential to efficiently arrive at an accurate diagnosis. This seminar will review the author's approach to the diagnosis of chronic diarrhea.

Clues obtained during the history and physical examination may suggest a diagnosis or help to rank the differential diagnosis. A thorough description of the diarrhea should be obtained (Table 1: diarrhea history form). The dietary history should include the diet being fed, meal size, meals / day, past diet changes and effects on clinical signs, supplements, and the existence of dietary indiscretion. Dietary indiscretion includes a recent and sudden diet change, feeding of table scraps, free roaming behavior allowing ingestion of garbage, ingestion of foreign objects, exposure to toxins (including house plants), excessive ingestion of hair, or feeding a low-quality poorly digestible diet. The duration of the problem should be identified and the diarrhea should be categorized as continuous or intermittent. If intermittent, how long are the episodes and how frequently do they occur? Are there any inciting factors the owner can relate to the origin of the diarrhea or that make the clinical signs worse? Examples include any stress, travel thunderstorms, new pet, loss of a pet, new family member, household move, etc. Does vomiting accompany diarrhea? How many times a day does vomiting occur, how many days / week, what is its association with eating, and what does the vomitus look like? What is the animal's deworming history? What previous treatments have been used, including dosage, frequency / day, and duration, and what response has been seen?

Specific information should be obtained describing and characterizing the diarrhea. What is the frequency / day, is there melena or hematochezia, mucus, tenesmus, or accidents in the house? What is the volume of stool / defecation, compared to what is normal for the dog or cat? Is the animal's appetite normal, reduced, or increased? Has weight loss occurred, and how much? Finally, the consistency of the stool should be graded from 1 (watery diarrhea) to 5 (formed stool). The above characteristics should be based on the animal's average clinical signs during the period prior to your examination. Based on a thorough history, the initial step in evaluation of dogs and cats with chronic diarrhea is to determine if diarrhea is of small bowel, large bowel, or mixed bowel origin (Table 2). Small bowel diarrhea is characterized by weight loss, a mildly increased frequency of defecation, and a large quantity of stool produced per defecation. Blood, if present, is partially digested (melena). On the other hand, large bowel diarrhea is characterized by the absence of weight loss, and a moderate to greatly increased frequency of defecation, with a reduced to scant volume produced per defecation. Tenesmus, excess fecal mucus, and frank blood (hematochezia) is often present. Mixed bowel diarrhea has some characteristics of both. This initial distinction between small and large bowel is extremely important because the diagnostic plans and differential diagnoses are different.

Physical examination is often normal in dogs and cats with chronic diarrhea with the exception of weight loss. Mildly thickened bowel wall may be palpated. If a severe episode of clinical signs is present, signs of dehydration may be detected (delayed capillary refill time, enophthalmos, decreased skin turgor, tachycardia, pale mucous membranes, and cold extremities). Careful attention should be devoted to abdominal palpation to detect abnormalities such as dilated (gas, fluid, or ingesta) loops of bowel or extremely thickened bowel wall, abdominal masses, intraluminal foreign bodies, or ascites. These abnormalities are detected in <5% of cases seen at the author's hospital. Digital rectal examination may elicit pain and reveal an intraluminal mass, rough corrugated mucosa, sublumbar lymphadenopathy, narrowed lumen, foreign material, blood on the glove, or a perineal hernia.

## Laboratory diagnosis of chronic diarrhea

Many laboratory tests may be used in the diagnosis of patients with chronic diarrhea. Routine complete blood count, biochemical profile and urinalysis is often normal. Evidence of anemia and hypoproteinemia may reflect protein and blood loss into the GI tract. Anemia initially may be regenerative, but as iron deficiency develops, it may become nonregenerative. In addition, a nonregenerative anemia associated with chronic disease may be found. Eosinophilia may reflect the presence of inflammatory bowel disease or gastrointestinal parasites. Hypoproteinemia associated with protein losing enteropathy is a panhypoproteinemia with decreased albumin and globulins. The FeLV / FIV test may be positive. Serum thyroxine levels may be elevated in older cats with hyperthyroidism and chronic small bowel diarrhea.

Perhaps the most important test for evaluation of dogs and cats with chronic diarrhea is fecal examination for parasites. Many problem diarrhea cases are caused by the protozoan parasite *Giardia*. Routine fecal flotation techniques rarely identify this parasite. The zinc sulfate sedimentation technique is sensitive for the diagnosis of *Giardia* and other GI parasites. One to two grams of feces is well mixed in a tube with a 33% zinc sulfate solution and strained. The tube is centrifuged for 3-5 minutes at 1,500 rpm. If a free-

swinging head centrifuge is used, the tube is topped with a coverslip and the coverslip examined for parasites. If a fixed-head centrifuge is used, a drop of the surface layer is collected and examined. A single zinc sulfate floatation has identified approximately 75% of *Giardia* infected dogs, while 3 samples examined every other day identified >95% of infected dogs! The SNAP *Giardia* fecal ELISA is a recent addition to aid in the diagnosis of *Giardia*. In most cases the author feels that a single zinc sulfate floatation combined with a *Giardia* SNAP test are adequate to diagnose the presence or absence of *Giardia*.

Feces can also be examined microscopically by adding a few drops of saline to a thin smear of fresh feces. This may allow visualization of trophozoites. *Giardia* trophozoites move across the field as a leaf falls from a tree. A saline fecal smear been shown to detect about 20% of dogs infected with *Giardia*. By repeating the test on three successive stool samples, detection rates have increased to approximately 40%. In addition, highly motile, spiral-shaped bacteria may suggest a *Campylobacter* infection.

Fecal or rectal cytology can also be performed by staining a thin fecal smear with Wrights stain. A rectal cytology specimen can be collected by scrapping the rectum with a gloved finger and gently rolling the finger across a glass slide. Alternatively, a moistened cotton swab or conjunctival spatula can be used. Normal fecal or rectal cytology should contain colonic epithelial cells, a mixed population of bacteria, yeast, and unidentifiable debris. Increased numbers of white blood cells or red blood cells may be indicative of inflammatory, infectious, or hemorrhagic disorders. The presence of more than 3-5 spores / hpf of *Clostridium perfringens* suggests the possibility of enterotoxigenesis. Spores appear as large rods with a clear center and dark staining ends (safety pins). *Campylobacter* organisms may appear gull-shaped. Occasionally, neoplastic cells may be seen or inclusions may be found within macrophages suggesting fungal infection with *Histoplasma*.

The gold standard test for diagnosing pancreatic exocrine insufficiency in dogs is determination of serum trypsin-like immunoreactivity. Trypsinogen, a pancreas specific substance, leaks from the pancreas into blood. It is filtered by the kidney. After a 12-hour fast, one ml of serum can be assayed. Concentrations >5 ug/l indicate normal pancreatic exocrine function. The test has recently been validated for cats, although this is a rare condition in this species.

Determination of serum vitamin B<sub>12</sub> and folic acid concentration can be beneficial in diagnosis of bacterial overgrowth of the small intestine (SIBO) in dogs. These bacteria bind and metabolize vitamin B<sub>12</sub> and produce additional folic acid, resulting in decreased B<sub>12</sub> levels and increased folic acid levels. However the test is insensitive and only fairly specific. Diagnosis of SIBO requires quantitative aerobic and anaerobic culture of duodenal juice. However, many cats with chronic GI are deficient in vitamin B<sub>12</sub>, and benefit from parenteral supplementation.

Radiographic evaluation of dogs and cats with chronic diarrhea is not a very high yield procedure. Changes seen on survey films may include dilated, gas-filled loops of small bowel, an abdominal mass, radiodense foreign body, or ascitic fluid. An upper GI contrast series may demonstrate evidence of enteritis, a dilated loop of bowel not previously identified, a soft tissue mass, or decreased motility. Abdominal ultrasound can be useful in the cases with palpable abdominal abnormalities detected during physical examination. Masses, thickened bowel walls, and mesenteric lymphadenopathy can be localized and fine needle aspiration or Tru-Cut biopsy samples obtained. Abdominal ultrasound should be done in animals in which lymphoma or other neoplasms are high on the rule out list. In a group of dogs with chronic diarrhea the following factors were associated with a higher diagnostic utility of abdominal ultrasound: the presence of weight loss, palpation of an abdominal or rectal mass on initial physical examination, localization of diarrhea to mixed bowel (vs. large bowel), diseases that commonly have mass lesions that should be visible on ultrasound examination, and a clinical diagnosis of GI neoplasia.

For many small intestinal disorders biopsy is necessary for diagnosis. Endoscopic examination of the duodenum with mucosal biopsy is a minimally invasive method of obtaining tissue. In the author's experience, evaluation of the duodenum and proximal jejunum results in accurate diagnosis in at least 75% of dogs and cats with chronic small bowel diarrhea. A duodenal aspirate for *Giardia* can be performed. If endoscopy is not available, exploratory celiotomy can be performed. Multiple full-thickness biopsies of the small bowel should be taken, mesenteric lymph nodes biopsied, and a duodenal aspirate examined for *Giardia* trophozoites. Ten ml of saline can be injected into the duodenum, aspirated, centrifuged, and the pellet examined for motile trophozoites.

For animals with large bowel diarrhea, colonoscopic examination is a high yield diagnostic test. Rigid colonoscopy allows evaluation of the descending colon which should be diagnostic in approximately 90% of cases with large bowel diarrhea. Flexible colonoscopy allows evaluation of the transverse and ascending colon, cecum, and possibly the ileum. Proper preparation for colonoscopy is essential to allow visualization of the entire mucosal surface. The animal should be held off food for 24 hours. Two doses of GoLYTELY should be given 2 hours apart, the afternoon prior to endoscopy. Dogs receive 60 ml/kg via orogastric tube while cats get 30 ml/kg via nasoesophageal tube. A warm water enema should follow each GoLYTELY and a third prior to anesthesia. When doing endoscopy, biopsies should always be taken, even if the mucosa looks normal.

Bacterial culture is a low yield diagnostic procedure. Specific pathogens that should be cultured for include *Salmonella*, *Campylobacter*, and *Yersinia*.

## Differential diagnosis

Table 3 lists some causes of chronic small and large bowel diarrhea. The most common causes of small bowel diarrhea include GI parasites, highly digestible diet-responsive small bowel diarrhea, and inflammatory bowel disease. In cats, it is important to consider hyperthyroidism and infection with FeLV /FIV. Common causes of chronic large bowel diarrhea include *Trichuris vulpis*, highly digestible diet-responsive large bowel diarrhea, plasmacytic lymphocytic colitis, irritable bowel syndrome, *Clostridium perfringens* enterotoxigenesis, fiber-responsive diarrhea, and neoplasia.

## Diagnostic plan (figure 1)

Based on history and physical examination, diarrhea should be localized to the small bowel, large bowel, or mixed bowel. In cases of small bowel diarrhea, the next distinction to be made is based upon abdominal palpation. If abdominal palpation is abnormal (<2% of cases) diagnostic evaluation should proceed with survey abdominal radiographs, abdominal ultrasound, a barium upper GI series, and exploratory laparotomy. If neoplasia is very likely, 3-view thoracic radiographs should be performed to evaluate the presence of metastasis. Many practitioners will skip the barium series and go straight to surgery, reducing the cost to the client and the time to diagnosis.

If abdominal palpation is normal, multiple fecal examinations should be performed to rule out gastrointestinal parasites. Treatment for *Giardia* with metronidazole or fenbendazole is indicated prior to invasive diagnostic procedures. In addition, a dietary trial using a highly digestible diet for 3-4 weeks is also indicated. The diet should contain a highly digestible carbohydrate, be low in fat, low in fiber, and lactose and gluten-free. Many commercially available diets are available, including several diets for cats.

If diarrhea continues despite negative fecal examinations, treatment for *Giardia*, and a 3-4 week dietary trial, further evaluation should include measurement of serum trypsin-like immunoreactivity in dogs with a strong clinical suspicion of exocrine pancreatic insufficiency. In cats, tests for FeLV / FIV should be performed. Middle-aged and older cats should be tested for hyperthyroidism.

Further evaluation should include a complete blood count, biochemical profile, and urinalysis. Survey abdominal radiographs may be taken (or abdominal ultrasound performed) to rule out any abnormalities not detected by palpation. Multiple small intestinal biopsies should be collected by endoscopy if available, or via exploratory laparotomy. Serum B<sub>12</sub> and folic acid may be measured to indirectly assess bacterial overgrowth, if a diagnosis has not been reached or the dog is not responding to appropriate therapy.

If chronic large bowel diarrhea is present, the initial diagnostic plan should consist of multiple fecal examinations for parasites, a 3-4 week dietary trial with a highly digestible diet, therapeutic deworming for whipworms and rectal cytology. In cases of large bowel diarrhea, a dietary trial utilizing higher levels of fiber may be beneficial. If diarrhea persists after these steps, an expanded database should include a complete blood count, biochemical profile, urinalysis, T<sub>4</sub> and FeLV / FIV testing for cats, and colonoscopy with multiple mucosal biopsies. If available, fecal assay for *Clostridium* enterotoxin or a therapeutic trial with amoxicillin should be performed prior to colonoscopy. If the colon is found to be normal with rigid endoscopy and a flexible endoscope is not available, a barium enema may be administered to evaluate the transverse and ascending portions of the colon. On rare instances, fecal cultures should be submitted, especially if increased numbers of neutrophils are seen on colonic or fecal cytology.

## Figure 1- Chronic diarrhea history

Date \_\_\_\_\_

Duration of diarrhea:

Continuous or intermittent (circle)

If intermittent:      Length of episode:

Frequency of episode:

Inciting factors (dietary indiscretion, stress, travel, thunderstorms, separation anxiety, nervous temperament etc.):

When diarrhea is present:

Frequency / day

Blood (indicate melena or hematochezia):

Mucus:

Tenesmus:

Accidents in house (how often):

Volume of stool : decreased normal increased (circle):

Stool grade: 1-5:

Appetite (circle)      normal or slightly reduced or greatly reduced or none or increased (circle)

Weight loss? Yes or No (circle)

If present how much?

Abdominal pain? Yes or No (circle)

Excessive borborygmus / flatulence? Yes or No (circle)

Vomiting? Yes or No (circle)

If present: frequency / day:

days / week:

association with eating:

character of vomitus:

Diet (type, changes, effects):

Meals / day:

Maintenance medications:

Previous treatments (drug, dose, duration, response): continue on back of form if necessary

small bowel large bowel mixed bowel (circle)

Answer each question for the average clinical sign. If frequency or severity has progressed, indicate (frequency was 5/day, during last 4 weeks 9/day).

### Chronic diarrhea activity index (CDAI)

Score each of the categories based on the severity of clinical signs during the 2 weeks prior to the animal's visit.

Category	Points possible
Attitude / activity	0 – normal 1 – slightly reduced 2 – moderately reduced 3 – severely reduced
Appetite	0 – normal 1 – slightly reduced 2 – moderately reduced 3 – severely reduced
Vomiting	0 – none 1 - < 4/week 2 - < 8/week 3 - > 7/week
Stool consistency	0 – Mostly grade 4 or 5 1 – Mostly grade 3, some grade 4 2 – Mostly grade 2, some grade 3 3 – Mostly grade 1, some grade 2 4 – Always grade 1
Stool frequency	0 – normal 1 – 1-2x normal 2 – >2-3x normal 3 – >3x normal
Weight loss	0 – none 1 - < 5% 2 – >5 - <10% 3 - >10%
Blood – Melena or hematochezia	0 – none 1 – positive
Mucus	0 – none 1 – positive
Tenesmus	0 – none

	1 - positive
Total Points	

Adopted from Jergens st. al. A scoring index for disease activity in canine inflammatory bowel disease. JVIM 2003; 17: 291-297.

**Table 2: Localization of chronic diarrhea**

<b><u>SIGN</u></b>	<b><u>SMALL BOWEL</u></b>	<b><u>LARGE BOWEL</u></b>
Weight loss	Positive	Negative
Frequency	Normal - mild increase	Normal - Moderate - large increase
Volume	Normal - Increased	Normal - Decreased
Tenesmus	Negative	Positive
Blood	Melena	Hematochezia
Mucus	Negative	Positive

**Table 3: Chronic diarrhea- differential diagnosis**

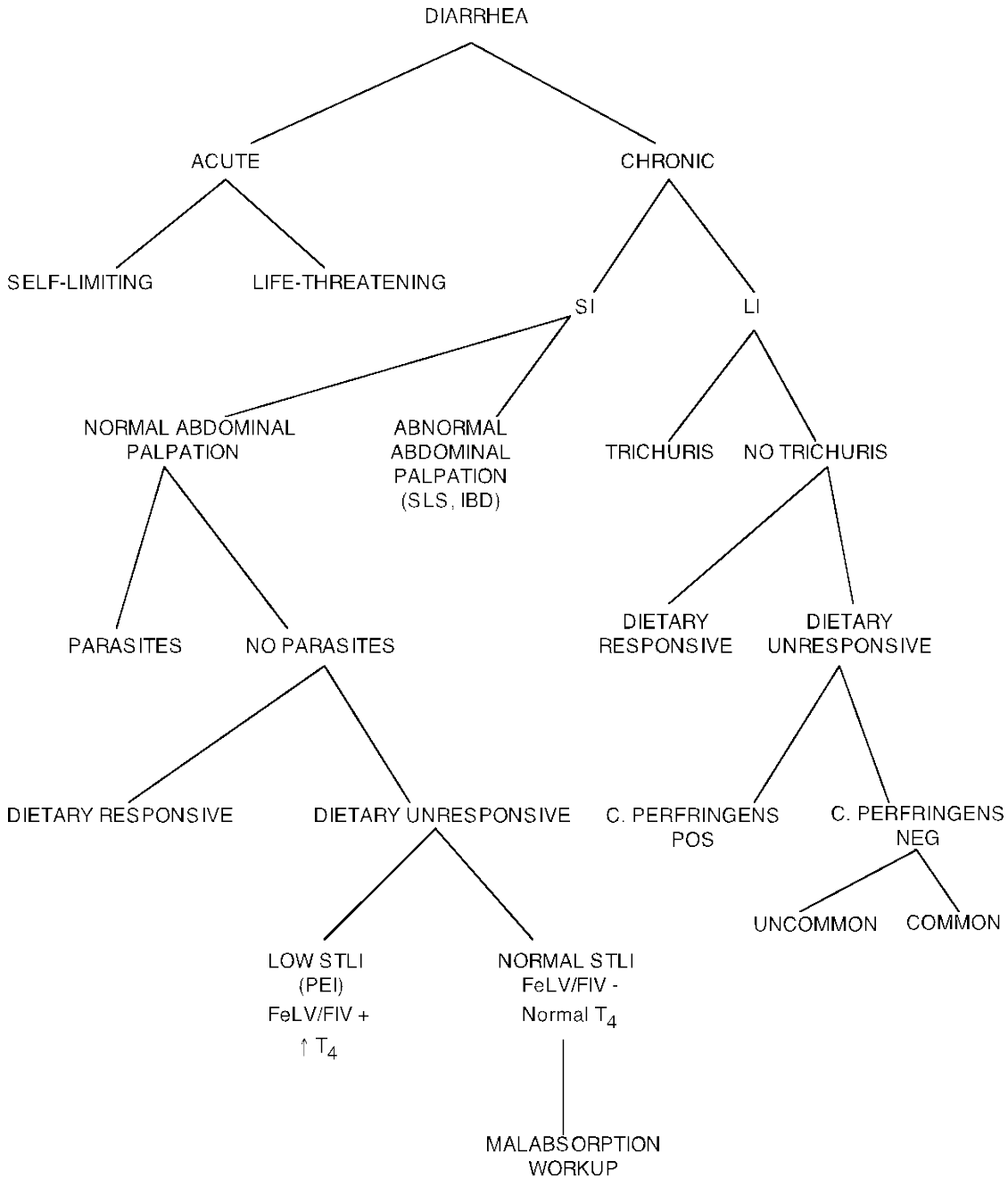
**Chronic small bowel diarrhea**

- Giardia, hookworms, roundworms
- Dietary indiscretion / Highly digestible diet - responsive
- Pancreatic exocrine insufficiency
- Inflammatory bowel disease
- Stagnant loop syndrome
- Feline hyperthyroidism
- Lymphosarcoma - diffuse
- Lymphangiectasia
- Neoplasia
- Antibiotic responsive diarrhea / Small intestinal bacterial overgrowth
- Feline leukemia virus
- Feline immunodeficiency virus
- Histoplasmosis

**Chronic large bowel diarrhea**

- Whipworms,
- Dietary indiscretion / Highly digestible diet - responsive
- Plasmacytic lymphocytic colitis
- Irritable bowel syndrome
- Neoplasia
- Fiber-responsive diarrhea
- *Clostridium perfringens* enterotoxigenesis
- Histoplasmosis
- Eosinophilic colitis

**Figure 1: Diagnostic approach to chronic diarrhea**



**Chronic diarrhea case 1**

**Signalment**

2.5 yr SF Irish setter

**History**

- Diarrhea of 5 months duration
- Frequency: once every 4-5 days, gradually progressed to 2/day
- Quantity/defecation: normal
- Tenesmus, hematochezia, excess mucus, Grade III
- No weight loss, good appetite
- Fecal examination: hookworms, treated with pyrantel

- Treated with mebendazole and fenbendazole
- Negative fecals x3
- Diet i/d and Ken-L-Ration Biscuit
- Environment: fenced in yard
- Other pets: 3 dogs, 4 cats all normal

#### **Past history**

Hit by car: traumatic myocarditis, acetabular fracture, stray dog

#### **Physical examination**

Normal

#### **Localization of diarrhea (Circle one) –**

Small bowel - Large bowel - Mixed bowel

#### **Differential diagnosis**

- IBD - plasmacytic lymphocytic / eosinophilic colitis
- *Clostridium perfringens* enterotoxigenesis
- Fiber-responsive large bowel diarrhea
- Irritable bowel syndrome
- Lymphoma

#### **Diagnostic plan**

- Fecals x3 - done
- RX whipworms - done x2
- GI diet - done
- Rectal cytology
- RX Clostridium
- +/- Clostridium enterotoxin
- Colonoscopy

#### **Diagnostic results/diagnosis**

- Fecal neg
- Rectal cytology - normal
- Clostridium enterotoxin neg
- Colonoscopy - 15 cm superficial erosion, histopathology - PL colitis

#### **Therapy**

- Hypoallergenic diet - d/d
- FU 4 weeks - 2 short episodes diarrhea, colonoscopy - hemorrhagic ascending colon, granular descending colon, histopathology - PL colitis with inc eosinophils, RX sulfasalazine 1 g TID
- FU 3 months - infrequent diarrhea, colonoscopy and histopathology normal, tear production dec 50%, dec sulfasalazine 500 mg TID
- FU 7 months - diarrhea with dec sulfasalazine, RX tylosin 20 mg/kg BID - no response
- FU 28 months - prednisone 1 mg/kg SID tapered to 0.25 mg/kg q 48H

### **Chronic diarrhea case 2**

#### **Signalment**

Male German shepherd dog, 2 yrs

#### **History**

- Diarrhea for 4 months, 20 kg weight loss, voracious appetite.
- Frequency: 3-8 times/day
- Large amount of feces per defecation, Grade II
- Environment: runs loose on farm
- Diet: Purina dog chow and canned Alpo

#### **Previous therapy**

- Metronidazole 1 gm SID x 6 days
- Fenbendazole 50 mg/kg SID for 3 days
- Pancreatic enzyme powder (1 TBS/meal)
- No improvement

#### **Physical examination**

Emaciation. Normal abdominal palpation. Rectal examination normal.

### Localization of diarrhea (circle one)

Small bowel - Large bowel - Mixed bowel

### Differential diagnosis

- Giardia
- PEI
- IBD
- SIBO
- Lymphoma
- Lymphangiectasia
- Partial SI obstruction

### Diagnostic plan

- Fecals x3, SNAP *Giardia*
- STLI
- +/- abdominal radiographs
- +/- abdominal ultrasound
- CBC, biochemical profile, UA
- Endoscopy
- +/- serum B12 / folate
- Exploratory laparotomy

### Diagnostic results/diagnosis

- MDB normal
- Fecal x3 neg, SNAP *Giardia* not available
- STLI <1 (5-35)
- B12 352 (225-660)
- Folate 21.7 (6.7-17.4)
- Endoscopy and histopathology normal, quantitative aerobic anaerobic duodenal culture - ?
- DX - PEI with secondary bacterial overgrowth

### Therapy

- Pancreatic enzyme powder 2 TBSP TID
- Low fat diet
- Doxycycline 5 mg/kg BID x 21
- FU day 3 - normal stool
- FU day 14 -3 kg weight gain, died mesenteric volvulus

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