A Case-Based Approach to Diarrhea
Elizabeth A. Carsten, DVM, DACVIM
IDEXX Laboratories

- **Problem-Oriented Approach**
  - Step 1: Information gathering (establish a database)
    - History
    - Physical examination
    - Admission laboratory work
  - Step 2: Identify & list all problems
  - Step 3: Establish rule-outs for each problem
  - Step 4: Design a plan to diagnose each problem
  - Step 5: Prioritize the workup of each problem and institute diagnostics
    - Threat to health of patient
    - Owner’s degree of concern
    - Logistics and expense of workup
  - Step 6: Update the problem list until a diagnosis is reached or the problem is sufficiently refined
    - Institute therapy
    - Advise of prognosis
    - Educate the client about the disease
  - Step 7: Follow up on each problem
    - Resolution of signs: end of problem
    - Unsuccessful therapy: institute further diagnostics
- **Signalment**
  - Young vs. Aged
  - Breed?
  - Spayed/Neutered
- **History**
  - Vaccination status
  - Environmental history
  - Diet
  - Duration and frequency of normal/abnormal stools
    - Severity of disease
    - Normal stool in am, but soft/watery stools during the day
    - Changes in activity
  - Small bowel diarrhea
    - 2-4 times per day
    - Weight loss
- Large volumes of liquid feces
- Melena=upper GI bleeding
  - Large bowel diarrhea
    - 4-10 times per day
    - Tenesmus
    - Dyschezia
    - Mucous
    - Fresh blood
    - Fecal incontinence (more than small bowel)
  - Color of stool
    - More variable in small bowel
    - Yellow/green associated with incomplete metabolism of bilirubin
    - Melena
    - Gray color associated with increased fecal fat
  - Content of stool
    - Undigested food
    - Foreign material/wrappers/bone fragments

- **Physical examination**
  - Attitude, behavior & posture of unrestrained animal
    - Abdominal pain—praying position? Hunched abdomen?
    - Perineal pain—how is the tail carried?
    - Hyperactive behavior of hyperactive cats
  - Weight loss?
  - Hydration Status
    - Skin Turgor
    - Mucous Membranes
    - Heart Rate/ Pulse Quality
  - Other Systems (don’t just skip to the abdomen!)
    - Lymphadenopathy?
    - Body Condition
    - Cardiopulmonary
    - Reproductive
    - Musculoskeletal
  - Abdominal Palpation
    - Hepatic Margins
    - Genitourinary
    - Gastrointestinal
      - Fluid- or gas-filled bowel loops?
      - Thickened bowel loops?
      - Masses/foreign objects
      - Abdominal auscultation
    - Pain?
  - Rectal Palpation
    - Perianal fistula or perineal hernia?
    - Fecal evaluation
    - Fecalt masses, strictures, foreign objects
- Anal sac disease

- **Identify small vs. large bowel diarrhea and severity**—these factors will have the greatest impact on initial clinical approach to the patient

- **Chronic small bowel diarrhea**
  - Initial laboratory work
    - CBC
    - Serum chemistry panel (with electrolytes)
    - Urinalysis
    - Fecal flotation & direct smear
    - Rectal scraping cytology (dog>cat)
    - Cat: include FeLV, FIV, +/- FIP, T4
  - Pancreatic function
    - Trypsin like immunoreactivity (TLI) is the gold standard test for exocrine pancreatic insufficiency (EPI)
    - Many other GI diseases may respond/improve with pancreatic enzyme supplementation, so a therapeutic trials tend to over-diagnose EPI
    - Spec cPL/fPL for diagnosis of pancreatitis
  - Abdominal radiographs
    - Although partial obstruction due to foreign bodies, intussusceptions or masses are only occasional causes of diarrhea, they can be diagnosed on survey and/or contrast radiography—serious consequences can arise if mis-diagnosed
    - Identify gross abnormalities and/or size of other organs
    - Presence of fluid, masses, torsions, etc.
  - Abdominal ultrasound
    - Intestinal mural thickening or changes in layering
    - Mesenteric lymphadenopathy
    - Abdominal masses
    - Intussusceptions
    - Can biopsies be obtained via endoscopy, or is laparotomy or laparoscopy needed?
  - Dietary trial
    - Food allergy & gluten sensitivity can only be diagnosed by trial; no pathognomonic histopathologic changes
    - Use easily digestible, selected protein diet (e.g. cottage cheese or tofu and rice) for at least 2 weeks
  - Tests for bacterial enteritis/enterocolitis
    - Fecal culture or PCR?
    - *Salmonella* spp.
    - *Campylobacter jejunia* spp.
    - *Yersinia enterocolitica*
    - These bacteria can be isolated in small numbers from normal animals; thus their presence does not automatically indicate the etiology of the diarrhea
    - *Clostridium* spp. enterotoxin ELISA
Tests for small intestinal bacterial overgrowth (SIBO)
- Breath hydrogen testing
- Cobalamin & folate levels
  - Classic = low cobalamin & increased folate
- Identify underlying cause! SIBO is a consequence of a primary intestinal abnormality

Miscellaneous ancillary tests
- Fecal occult blood testing
  - Animal must be on meat-free diet for 3 days prior to testing to avoid false positive from the diet
- Gastrin levels help support diagnosis of gastrinoma (pre-antacid therapy)
- Fecal alpha-1 protease can help identify intestinal protein loss

Endoscopy (done correctly, can be diagnostic)
- Utilize 2.8 mm biopsy channel or greater
- Obtain at least 6-8 good quality tissue samples: full thickness of the mucosa down to and preferentially including submucosa
- Biopsy duodenum and ileum (especially in cats); cannot obtain jejunal samples in most patients
- Will not diagnose motility disorders, brush border enzyme defects
- Duodenal fluid-aspiration for cytology and/or culture?

Exploratory laparotomy
- Visual inspection, palpation, and biopsies of multiple organs
- Full thickness bowel biopsies—be sure not to take a “wedge” biopsy
- Biopsy all portions of the GI tract, even if it looks and feels normal

CAUSES OF SMALL-BOWEL DIARRHEA

- Dietary
  - Food poisoning
  - Gluttony
  - Sudden change of diet
  - Intolerance
  - Wheat-sensitive enteropathy
  - Allergy

- Stomach
  - Dumping syndromes
  - Hyperacidity
  - Achlorhydria

- Small Intestinal Disease
  - Infectious enteritis (viral, fungal, bacterial enterotoxins & endotoxins, invasive bacteria)
  - Parasites (Cryptosporidia, Giardia, Strongyloides, ascarids, hookworms, Salmon poisoning)
  - Inflammatory bowel disease (eosinophilic, lymphacytic/plasmacytic, other)
  - Infiltrative neoplasia
- Other infiltrative disease: fucosidosis, amyloidosis
- Partial intraluminal obstruction
- Extraluminal obstruction
- Brush border enzyme defects
- Bacterial overgrowth
- Ileus (hypokalemia, hypoalbuminemia, enteritis, dysautonomia)
- Hypermotility
- Ischemic diseases
- Lymphangectasia
- Hemorrhagic gastroenteritis

- Pancreatic disease
  - Chronic pancreatitis
  - Pancreatic neoplasia
  - Juvenile atrophy
  - Obstruction of pancreatic ducts

- Liver disease
  - Liver failure
  - Intrahepatic cholestasis
  - Bile duct obstruction

- Kidney disease
  - Uremia
  - Nephritic syndrome

- Miscellaneous systemic disorders
  - Toxemias (pyometra, abscess, peritonitis)
  - Septicemias
  - Congestive heart failure
  - Immunodeficiencies (IgA)
  - Autoimmune disease (SLE)
  - Hypoadrenocorticism
  - Hyperthyroidism
  - APUDomas (gastrinomas, VIPomas, carcinoid syndrome)
  - Thyroid carcinoma
  - Metastatic neoplasia
  - Various toxins and drugs

- **Chronic large bowel diarrhea**
  - Initial laboratory work similar to small bowel
    - Consider multiple fecal evaluations as false negatives with low numbers of organisms shed
    - Fecal smears even more important, rectal scraping even better
      - *Giardia*
      - *Entamoeba histolytica*
      - *Histoplasma* organisms
      - Inflammatory cells
      - *Clostridium* spp. spores
o Trial therapy
  - Appropriate for uncomplicated cases
  - Empiric deworming
  - Diet
    - Low residue, easily digestible
    - High fiber
    - Novel protein or hypoallergenic
  - Sulfasalazine

o Abdominal radiographs
  - Only occasionally helpful
  - More important when tenesmus is the predominant sign
    - May detect prostatomegaly, abdominal masses, rectal diverticula and/or perineal hernias
  - Abdominal ultrasound rarely helpful

o Fecal cultures and/or PCR may be appropriate

o Endoscopy & colonic biopsy
  - Rigid proctoscopy preferred over flexible endoscopy in simple colitis patients as disease is usually diverse
  - Relatively easy to do & rigid equipment relatively inexpensive
  - Possible to perforate the colon (rare)
  - Cannot examine ascending or transverse colon
    - Important for ileocecal diseases

CAUSES OF LARGE-BOWEL DIARRHEA²

❖ Inflammatory Large Intestinal Disease
  - Acute nonspecific colitis
  - Chronic colitis (plasmacytic/lymphocytic, eosinophilic, granulomatous, histiocytic, suppurative)
  - Infectious colitis (FIP, FeLV, histoplasmosis, Salmonella, Campylobacter, Clostridium perfringens, Clostridium difficile, Prototheca, Yersenia enterocolitica)
  - Parasites (trichuris, giardia, hookworms, Salmon poisoning, Balantidium coli, Entamoeba histolytica, coccidia)
  - Pseudomembranous colitis (antibiotic associated)

❖ Obstructive Large-Bowel Disease
  - Intraluminal obstruction (constipation, megacolon, neoplasia, strictures, foreign body, intussusception)
  - Extraluminal obstruction (hernias, adhesions, masses)

❖ Ischemic Large-Bowel Disease
  - Trauma
  - Infarction
  - Torsion
  - Strangulation
  - Ileocolic intussusception

❖ Neoplastic Large-Bowel Disease
  - Adenocarcinoma
➢ Benign polyp
➢ Lymphosarcoma
➢ Plasmacytoma
➢ Others

❖ Noninflammatory Large-Bowel disease
➢ Cecal inversion
➢ Congenital malformations
➢ Diverticular malformations
➢ Exposure to secretagogues
➢ Motility abnormalities

❖ Systemic disorders
➢ Toxemias (pyometra, abscess, peritonitis)
➢ Uremia
➢ Metastatic neoplasia
➢ Toxicities

❖ Diet related
➢ Food poisoning
➢ Intolerances or allergy
➢ Foreign material

❖ Miscellaneous
➢ Acute pancreatitis (segmental colitis)
➢ Secondary to small bowel diarrhea (malabsorbed bile acids, etc.)

- Case presentations

References


Other general information throughout these notes taken from the following: