Vomiting and diarrhea are two of the most common clinical signs that accompany a wide variety of feline diseases, and not just those of the gastrointestinal tract itself. The first principle of dealing with these clinical signs is to address the underlying disease process as specifically and effectively as possible. But even in those cases with a definitive diagnosis and a specifically tailored treatment plan, vomiting and/or diarrhea may persist as clinical signs that significantly impact the quality of life of both the cat, and the owner trying to care for that cat. When considering therapy aimed at these clinical signs it is particularly important to remind ourselves that cats are not small dogs. Cats are “hardwired” differently than dogs in many respects when it comes to the central and peripheral pharmacology behind vomiting and diarrhea, and this must be taken into account if our attempted intervention is going to equal effective treatment.

Case examples
“My cat is dying! At least twice a week my cat turns himself inside-out and sounds like he is going to bring his guts up onto the floor. I mean, he sounds like Cujo going through an exorcism! Instead, he deposits something resembling the fur ball of mouse parts I used to see under the owl’s nest in my backyard as a kid. You gotta help him!”

First principles
Treating the underlying disease requires a diagnosis
Trichobezoars (Hair balls) are usually of minimal clinical consequence, although the cat often sounds like it is going through the throws of death to bring one up, and 2am seems to be the preferred time for expulsion. However, Barrs et al. (JFMS 1999) remind us that trichobezoars can cause partial or complete intestinal obstruction if the cat inappropriately tries to pass them out the wrong direction. At risk are long-haired cats (makes sense), both young and old, with a proclivity for ingesting non-digestible plant material. The cat may or may not have a concurrent disease process, and the abdominal mass identified on physical examination can be mistaken for a neoplastic process; representing a significantly different prognosis if misdiagnosed! Even if the cat is attempting to remove the hairball in the appropriate direction by vomiting, there are a number of reports of those attempts being unsuccessful (esophageal foreign body or stricture).

Surgery is the preferred method of removing an obstructing trichobezoar (as opposed to an endoscopic attempt) and clinicians should take that opportunity to obtain intestinal biopsies and histopathology. Even without an obstruction necessitating an abdominal explore, the persistent or frequent vomiting of hairballs should motivate the clinician to consider underlying gastrointestinal disease, such as an inflammatory condition leading to altered GI motility. As Dr. Keith Richter once said – “Hairballs are not due to deficiency of GI grease”.

“My new kitten has had diarrhea for months and it’s driving us nuts! We’ve been to 3 other vets and tried every treatment under the sun, some of thme twice – nothing helps. Otherwise the little guy acts just like the other kittens we saw at the humane society, but he poops so frequently his little bum is getting really red and sore. What the heck is going on?!”

First principles
Signalment, history, physical examination
Dr. Jody Gookin wrote the book (or I should say published the articles) that introduced feline practitioners to Tritrichomonas, a flagellated protozoan causing large bowel diarrhea (video available online at www.jodygookin.com). It is seen most frequently in cats < 2 years of age, often coming from shelters, catteries, or multi-cat households. Clinical signs include chronic waxing & waning malodorous large bowel diarrhea, or the kittens (and older cats) may be asymptomatic. The stool is semi-formed to liquid or cow patty, containing mucus and fresh blood, accompanied by flatulence. The kitten often strains to defecate (tenesmus) frequently enough to develop perianal inflammation, but is otherwise in good body condition with a normal appetite. The only dewormer demonstrating efficacy is Ronidazole (30 mg/kg PO q24hr 14d, potential neurotoxicity), although Dr. Gookin now reports strains that are resistant to this attempt!

“My 3-year old cat has had diarrhea for months now. We give him some antibiotics or some steroids or some dewormer and he gets better for a little while, then it’s back. What are we missing?!”
First principles
Food first
The terminology in veterinary medicine is evolving and it is now common place for clinicians to refer to “Food Responsive Diarrhea.” This term is able to encompass the classic food allergy and food intolerance while taking into account the observation that some cats will respond well to diets that are not actually designed to target a disease! A number of research efforts and publications over the last 10 years or so have highlighted the importance of early dietary intervention in cases of feline chronic diarrhea and vomiting. One of the most clinically significant findings of that research is that unlike a dermatologist, a gastroenterologist only needs about 2 weeks to determine if a diet trial has had an effect (8-12 for the dermatologist). So we can (and probably should) get the owner on board for attempting several food trials before we give up on seeing a beneficial effect, because it also appears that individual cats can respond to very specific diets; what diet works for one may not work for another, and visa-versa. The list of potentially beneficial diets is also expanding just about as fast as the pet food companies can produce them; hypallergenic, hydrolyzed, no-grain, highly digestible, canned or dry, high protein-low carbohydrate, gluten free, lactose free, preservative free, etc. Dietary intervention can also include dietary supplementation, another list that is fast outpacing the research available to support its use – but including cobalamin, liquid “toppings” of vitamins and micronutrients, fiber, omega-3 fatty acids, antioxidants, prebiotics, probiotics, etc.

Non-specific treatment considerations for feline diarrhea

History lesson
“Pharmaceutical agents are often given inappropriate precedence in the treatment of gastrointestinal tract diseases. Nutrients have marked influences on the gastrointestinal tract and manipulation of the diet provides clinicians with a powerful therapeutic strategy to be used alone or concurrently with drug therapy” W. Grant Guilford, J Nutrition, 1994

Acute gastroenteritis
Historically the first principle in the nutritional management of acute gastroenteritis has been no nutrition at all – “rest” the GI tract with a 24-48 hour fast. In addition to diarrhea, nausea and inappetence, the patient was often vomiting upon presentation, adding to the argument against putting anything (ie. food) down the pet’s throat. The potential contribution of acute pancreatic inflammation and the concern over stimulating the pancreas with food also fuels the fasting paradigm. Following the period of fasting, small quantities of a “bland” diet are gradually introduced as we hold our breath hoping the offending etiology has passed. A somewhat more scientific justification for a period of fasting would be the concern over antigen exposure in the gut during a period of inflammation, potentially creating a “food allergy” where previously there had been none. With cats this approach can be problematic. For one thing, a high protein/low carbohydrate diet does not fit the usual definition of a “bland” diet. The canine bland diet contains a small amount of highly digestible protein, a low fat content, and moderate to large amounts of highly digestible carbohydrate (ie. white rice). In addition, cats frequently can be anorectic for several days before their owner’s realize what’s (not) happening and present them to the veterinarian, and anorexia in a cat can have much more severe consequences than anorexia in a Labrador retriever. Not feeding a cat for 24 hours is still considered a viable way to “rest” the GI tract in cases of acute gastroenteritis, but the clinician must be aware of the likelihood that the clock on that 24-hour window may well have already run out by the time the patient is in your office.

If a feline patient at CSU is approaching 48 hours without having been convinced to take on nutrition voluntarily (or with the help of pharmaceutical intervention), we will move relatively quickly towards “assisted feeding” through either a nasoesophageal feeding tube (liquid diet such as CliniCare at 1 kcal/ml, or the human product Ensure, also 1 kcal/ml), or quite frequently, an esophageal feeding tube (E-tube) with a blenderized diet, particularly if we are trying to get the cat out of the hospital.

Dietary intervention for acute gastritis in cats:

- High quality protein
- Highly digestible diet (>90%), single ingredients, no additives or flavorings
- Moderate energy density, small amounts of highly digestible carbohydrate
- High moisture content
- Fat for palatability
- 3-4 meals/day

The quality of the protein source in the diet is perhaps the single key ingredient for the successful passage and placation of an inflamed feline GI tract. Any poor-quality, undigested protein enters the colon as food for the bacterial microbiota that reside there. This may result in a change in the quantity and quality of the colonic bacterial population (“there goes the neighborhood”), stimulates the secretion of water into the GI lumen, and increases the amount of ammonia produced and thereby further damages an already diseased GI mucosa. In short, exacerbates both the feel (softer) and smell (bad) of the problem (diarrhea).

Food responsive diarrhea, a chronic enteropathy of cats
The veterinary profession (with the persistent prodding of pet food companies) is expanding the clinical definition (a bit faster than our basic understanding) of the impact diet has on gastrointestinal disease. Even the language is evolving to acknowledge the fact that diet plays a role in GI health well beyond the simple classification of allergy or intolerance. Cataloging dietary components as a cause or contributor to GI disease has evolved from “It’s the beef” to looking at the potential role of grains, gluten, preservatives and...
preparation. Prescribing dietary intervention as a contributor to the cure for GI disease has evolved from single-source Lamb & Rice to diets incorporating most any creature on the planet, exotic vegetables, prebiotics, probiotics, a spectrum of digestibility, combinations of fibers and various volumes of fat, essential ingredients as well as essentially eliminated ingredients.

Dr. Guilford and many others have continued to contribute strong research evidence for the impact of diet as both the cause and potential cure for GI conditions. Several key take-home points from this effort are:

- A significant percentage of cats with GI disease will respond favorably, if not completely, to dietary intervention
- A diet trial for a gastroenterologist lasts about 2-weeks, compared to the 8-12 week effort for a dermatologist
- The standard dietary intervention remains the hypoallergenic/hydrolyzed diet
- A much more diverse array of dietary options should be considered
- Sometimes it is a matter of matching a specific diet with a particular patient, especially with cats

**Fiber - Non-digestible plant carbohydrate**

Soluble, fermentable fiber (ex. beet pulp) is easily broken down by GI bacteria into short-chain fatty acids (SCFA), an essential nutrient for repairing and maintaining a healthy GI mucosa. Soluble fiber will also slow down digestion, delay gastric emptying, inhibit absorption of nutrients and cholesterol, slow GI transit time, increase fecal water content, and shift the microbial balance towards “healthy” bacterial species (Lactobacilli and Bifidobacter) from unhealthy species (Clostridium and E coli).

- Oatmeal, oat cereal, lentils, apples, oranges, pears, oat bran, strawberries, nuts, flaxseeds, beans, psyllium, carrots
- Metamucil: psyllium, 1/8th – 1/4th teaspoon twice a day

Insoluble, poorly fermentable fiber (ex. cellulose) adds bulk to the stool, and may help normalize motility and act as a laxative. Colitis is the GI condition that appears to be most responsive to this action, hence the proliferation of “fiber-responsive” diets. Fiber-responsive diets high in insoluble fiber should be avoided in cats prone to constipation (chronic kidney disease) or obstipation (megacolon).

- Whole wheat, whole grains, wheat bran, seeds, nuts, barley, brown rice, zucchini, broccoli, carrots, green beans, root vegetable skins
- Canned pumpkin: 90% water, 3% fiber, 1-2 teaspoons per meal

For those constipated cats approaching megacolon, fiber-enriched diets are particularly important as dietary fiber may increase fecal consistency, bind potential colonic irritants, improve abnormal colonic motility, and produce beneficial short-chain fatty acids which nurture large bowel structure and function. Fermentable fibers (beet pulp, psyllium, soy fiber, or oat bran) is recommended for maintenance of colonic health.

**Probiotics**

Our knowledge of the GI microbiome is still incomplete. We know there are normal inhabitants, such as Firmicutes, Bacteroidetes, Fusobacteria, etc.; we know there are pathogens including various Clostridium, Campylobacter, Salmonella, and Escherichia spp; and we know that “dysbiosis” is a common finding in cats with chronic diarrhea as a result of GI disease.

What we know about the use of probiotics in GI disease is even more incomplete. We know that to have any chance of being beneficial, the probiotic supplement must 1) contain a lot of organisms – current human trials are often using orders of magnitude higher doses than those found in veterinary studies; 2) those organisms must be alive; 3) probiotic effects are likely to be rapid onset with minimal staying power once discontinued; 4) probiotics are assumed to work by changing the make-up of the intestinal microbiota, but may in fact exert effects in other ways; 5) fortunately, like cobalamin, probiotics seem to “do no harm”, with very few and very extra-ordinary exceptions.

**Cobalamin**

It was the Ruaux et al. study of 2005 (JVIM) that alerted the profession to the importance and impact of cobalamin supplementation (250 micrograms SQ once weekly) in cats with GI disease and marked hypocobalaminemia (≤ 100 ng/L). Since that seminal study cobalamin levels are being measured in cats with a wide variety of non-GI diseases and hypocobalaminemia may be a significant contributor to a number of conditions: a cobalamin less than 150 ng/L is suggestive of GI lymphoma in cats.

**Summary**

- Dietary intervention may not be the only therapy, but it must be a part of an effective plan
- It takes 3 strikes before a cat is out; even a different version of a diet-type may hit the mark
- 2 weeks, not 12, or “Thank Heaven I’m not a Dermatologist!”’, for a GI diet-trial
- Expand the definition of Dietary Intervention beyond Diets