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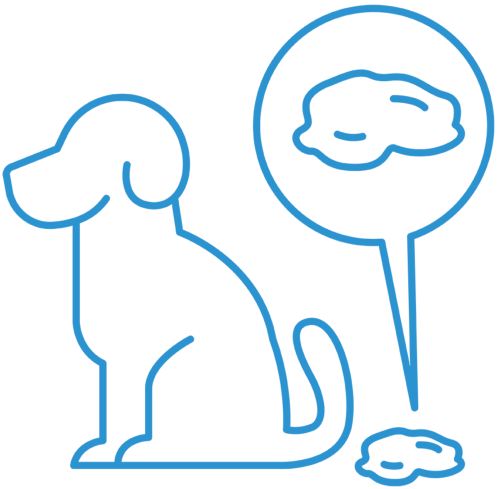

Chronic Diarrhea in Dogs

micro drip study guide

April 19, 2022

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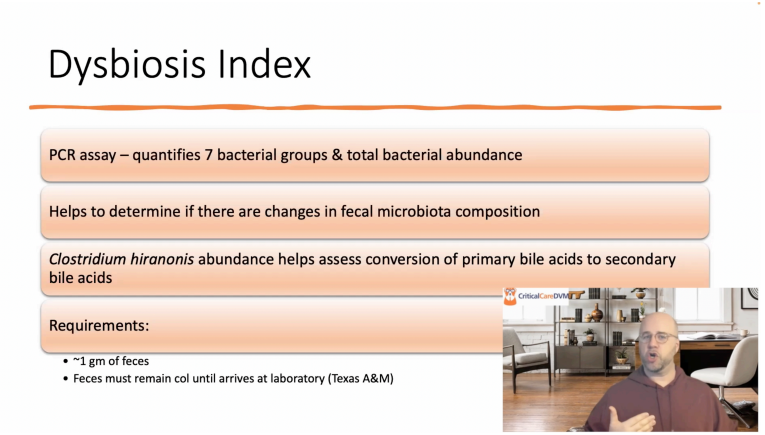
Dysbiosis

General causes of dysbiosis

- Abnormal substrate (medication, undigested nutrient)
- Changes in luminal bacterial species and/or amounts
- Changes in mucosal-adherent bacterial species and/or amounts
- Impaired microbiota function

When we say dysbiosis, what are we talking about? We're talking about maybe that the actual microbiota are dysfunctional. Maybe there's more of them present. And when we talk about them being present, they could be present just within the lumen, or they could actually be adhered to the intestinal wall, or maybe there's an abnormal substrate within the gastrointestinal tract.

Like something the patient is not digesting appropriately or the medication.



So we can in dogs-- this is not a feline assay yet, but in dogs, one can submit a fecal sample, approximately 1 gram of feces that is kept cold and shipped overnight. But it's a PCR assay, PCR's technology, and they're quantifying what is called abundance of the total bacterial population and seven specific bacterial groups.

And by doing so, we get some potentially helpful information about the changes to the fecal, fecal microbiota. So, for example, we pay a lot of attention to the bacterium, Clostridium hiranonis illness. Why? Because that is in a sense a marker that tells us if that patient is converting adequately, successfully, primary bile acids into secondary bile acids.

So again, this is just a simple fecal test. You only need a gram of feces. You keep them cold, and you send it off to Texas A&M University's gastrointestinal laboratory for this PCR assay.

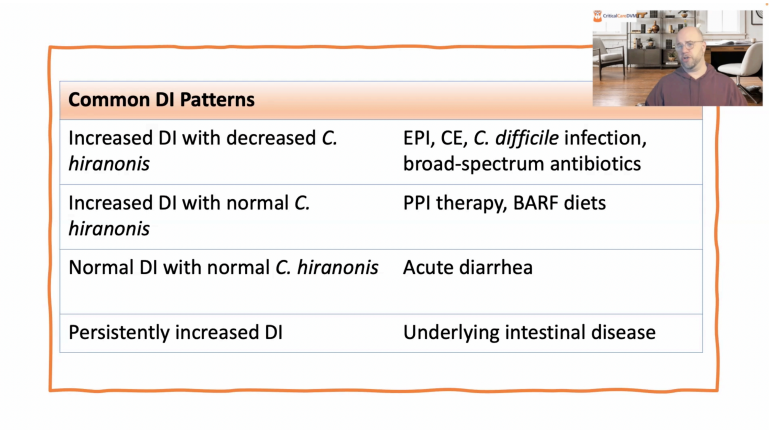
Table 1: 7 DI Bacterial Groups & Associated Reference Intervals (adapted from Texas A&M University)

Bacterium	Normal Abundance (log DNA/gm feces)	Dysbiosis Change
Faecalibacterium	3.4-8.0	Decreased
Turicibacter	4.6-8.1	Decreased
Streptococcus	1.9-8.0	Increased
Escherichia coli	0.9-8.0	Increased
Blautia	9.5-11.0	Decreased
Fusobacterium	7.0-10.3	Decreased
Clostridium hiranonis	5.1-7.1	Decreased

A DI result <0 is considered normal while a DI >2 is consistent with dysbiosis; a result 0-2 is considered equivocal.

And so, these are the seven bacterial species that are currently evaluated in this PCR test, as well as a list of what we expect to happen to each group when dysbiosis is present.

And then the last component of this test is they will give the Dysbiosis Index. And we want our patient's Dysbiosis Index to be less than zero. We don't want it to be greater than two. And of course, like almost every test you and I run, there's always the gray zone as well.



Common DI Patterns	
Increased DI with decreased *C. hiranonis*	EPI, CE, *C. difficile* infection, broad-spectrum antibiotics
Increased DI with normal *C. hiranonis*	PPI therapy, BARF diets
Normal DI with normal *C. hiranonis*	Acute diarrhea
Persistently increased DI	Underlying intestinal disease

And then, we look at patterns. We look at the overall Dysbiosis Index. We look at what's happening with the Clostridium hiranonis to help us come up with some reasonable, logical diagnostic differentials. So patients who have an increased Dysbiosis Index, and the Clostridium hiranonis abundance is decreased, we're usually talking about exocrine pancreatic insufficiency. They've just been exposed to broad-spectrum antibiotics like metronidazole, for example.

C. difficile infections aren't that common in canines and felines, but this pattern would be consistent with that. And so, we look for these common Dysbiosis Index patterns to further help us make next-level diagnostic recommendations to a family or to help guide therapy.

I do want to point out, you know, increased Dysbiosis Index with a normal Clostridium hirononis population or abundance, proton pump inhibitor therapy is on that list, omeprazole, Prilosec, because we as a profession, tend to use a lot of proton pump inhibitors. This just emphasizes how important patient history can be, because maybe you didn't prescribe omeprazole, but the owner's second cousin contacted her on Facebook and said, oh, it worked for my dog. And they just did it themselves.