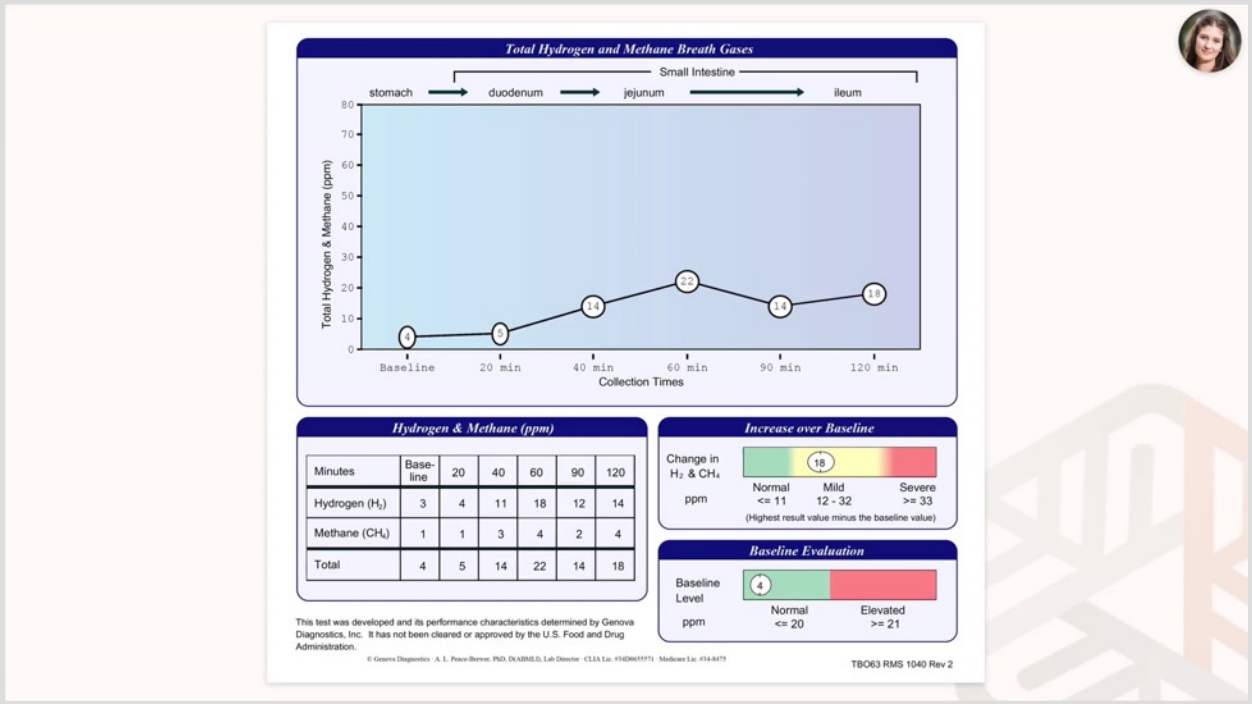
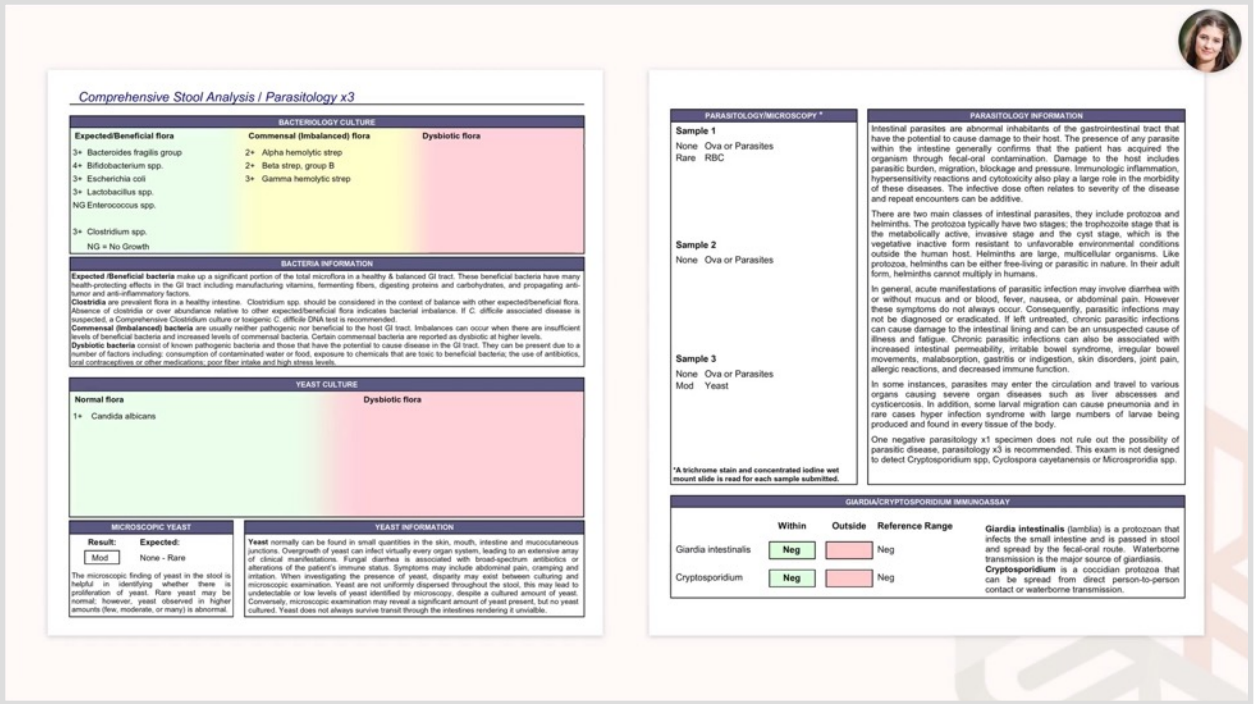
Gut Case Studies - Part 3

CASE #5: 37-YEAR-OLD FEMALE

All right, next patient: 37-year-old female, chief complaints were hypothyroidism, loose stools, fatigue, emotional reactivity. Her hair was also thinning, which was really disturbing for her, she was experiencing decreased athletic performance, exercise really wiped her out, and brain fog and memory issues.



So here are the Genova breath tests. The reason you're seeing so many of these Genova breath tests, by the way, is that earlier on, before I started working with NCMA and Commonwealth, this was the lab that I used for breath testing, so I have a lot of these in my case studies. Typically now I use NCMN or Commonwealth, as I explained in the testing unit. Genova's marking this as positive; the rise in hydrogen doesn't exceed 20 parts per million over the lowest value, it never gets above 20, so conventional Quintron criteria it wouldn't be positive, but methane is four parts per million at 60 minutes and at 120 minutes, which would be positive according to the Pimentel criteria. Interestingly, remember that methane predominantly is known to cause constipation, but this patient has very loose stool, so if methane is a problem, it's not causing the typical symptoms in this patient.



Comprehensive Stool Analysis / Parasitology x3

BACTERIOLOGY CULTURE

Expected/Beneficial flora	Commensal (Imbalanced) flora	Dysbiotic flora
3+ Bacteroides fragilis group	2+ Alpha hemolytic strep	
4+ Bifidobacterium spp.	2+ Beta strep, group B	
3+ Escherichia coli	3+ Gamma hemolytic strep	
3+ Lactobacillus spp.		
NG Enterococcus spp.		
3+ Clostridium spp.		
NG = No Growth		

BACTERIA INFORMATION

Expected /Beneficial bacteria make up a significant portion of the total microflora in a healthy & balanced GI tract. These beneficial bacteria have many health-protecting effects in the GI tract including manufacturing vitamins, fermenting fibers, digesting proteins and carbohydrates, and propagating anti-tumor and anti-inflammatory factors.
Clostridia are prevalent flora in a healthy intestine. Clostridium spp. should be considered in the context of balance with other expected/beneficial flora. Absence of clostridia or over abundance relative to other expected/beneficial flora indicates bacterial imbalance. If *C. difficile* associated disease is suspected, a Comprehensive Clostridium culture or toxigenic *C. difficile* DNA test is recommended.
Commensal (Imbalanced) bacteria are usually neither pathogenic nor beneficial to the host GI tract. Imbalances can occur when there are insufficient levels of beneficial bacteria and increased levels of commensal bacteria. Certain commensal bacteria are reported as dysbiotic at higher levels.
Dysbiotic bacteria consist of known pathogenic bacteria and those that have the potential to cause disease in the GI tract. They can be present due to a number of factors including: consumption of contaminated water or food, exposure to chemicals that are toxic to beneficial bacteria; the use of antibiotics, oral contraceptives or other medications, poor fiber intake and high stress levels.

YEAST CULTURE

Normal flora	Dysbiotic flora
1+ Candida albicans	

MICROSCOPIC YEAST

Result:	Expected:
Mod	None - Rare

The microscopic finding of yeast in the stool is helpful in identifying whether there is proliferation of yeast. Rare yeast may be normal; however, yeast observed in higher amounts (few, moderate, or many) is abnormal.

YEAST INFORMATION

Yeast normally can be found in small quantities in the skin, mouth, intestine and mucocutaneous junctions. Overgrowth of yeast can infect virtually every organ system, leading to an extensive array of clinical manifestations. Fungal diarrhea is associated with broad-spectrum antibiotics or alterations of the patient's immune status. Symptoms may include abdominal pain, cramping and irritation. When investigating the presence of yeast, disparity may exist between culturing and microscopic examination. Yeast are not uniformly dispersed throughout the stool, this may lead to undetectable or low levels of yeast identified by microscopy, despite a cultured amount of yeast. Conversely, microscopic examination may reveal a significant amount of yeast present, but no yeast cultured. Yeast does not always survive transit through the intestines rendering it unviable.

PARASITOLOGY/MICROSCOPY *

Sample 1
None Ova or Parasites
Rare RBC

Sample 2
None Ova or Parasites

Sample 3
None Ova or Parasites
Mod Yeast

***A trichrome stain and concentrated iodine wet mount slide is read for each sample submitted.**

PARASITOLOGY INFORMATION

Intestinal parasites are abnormal inhabitants of the gastrointestinal tract that have the potential to cause damage to their host. The presence of any parasite within the intestine generally confirms that the patient has acquired the organism through fecal-oral contamination. Damage to the host includes parasitic burden, migration, blockage and pressure. Immunologic inflammation, hypersensitivity reactions and cytotoxicity also play a large role in the morbidity of these diseases. The infective dose often relates to severity of the disease and repeat encounters can be additive.

There are two main classes of intestinal parasites, they include protozoa and helminths. The protozoa typically have two stages; the trophozoite stage that is the metabolically active, invasive stage and the cyst stage, which is the vegetative inactive form resistant to unfavorable environmental conditions outside the human host. Helminths are large, multicellular organisms. Like protozoa, helminths can be either free-living or parasitic in nature. In their adult form, helminths cannot multiply in humans.

In general, acute manifestations of parasitic infection may involve diarrhea with or without mucus and or blood, fever, nausea, or abdominal pain. However these symptoms do not always occur. Consequently, parasitic infections may not be diagnosed or eradicated. If left untreated, chronic parasitic infections can cause damage to the intestinal lining and can be an unsuspected cause of illness and fatigue. Chronic parasitic infections can also be associated with increased intestinal permeability, irritable bowel syndrome, irregular bowel movements, malabsorption, gastritis or indigestion, skin disorders, joint pain, allergic reactions, and decreased immune function.

In some instances, parasites may enter the circulation and travel to various organs causing severe organ diseases such as liver abscesses and cysticercosis. In addition, some larval migration can cause pneumonia and in rare cases hyper infection syndrome with large numbers of larvae being produced and found in every tissue of the body.

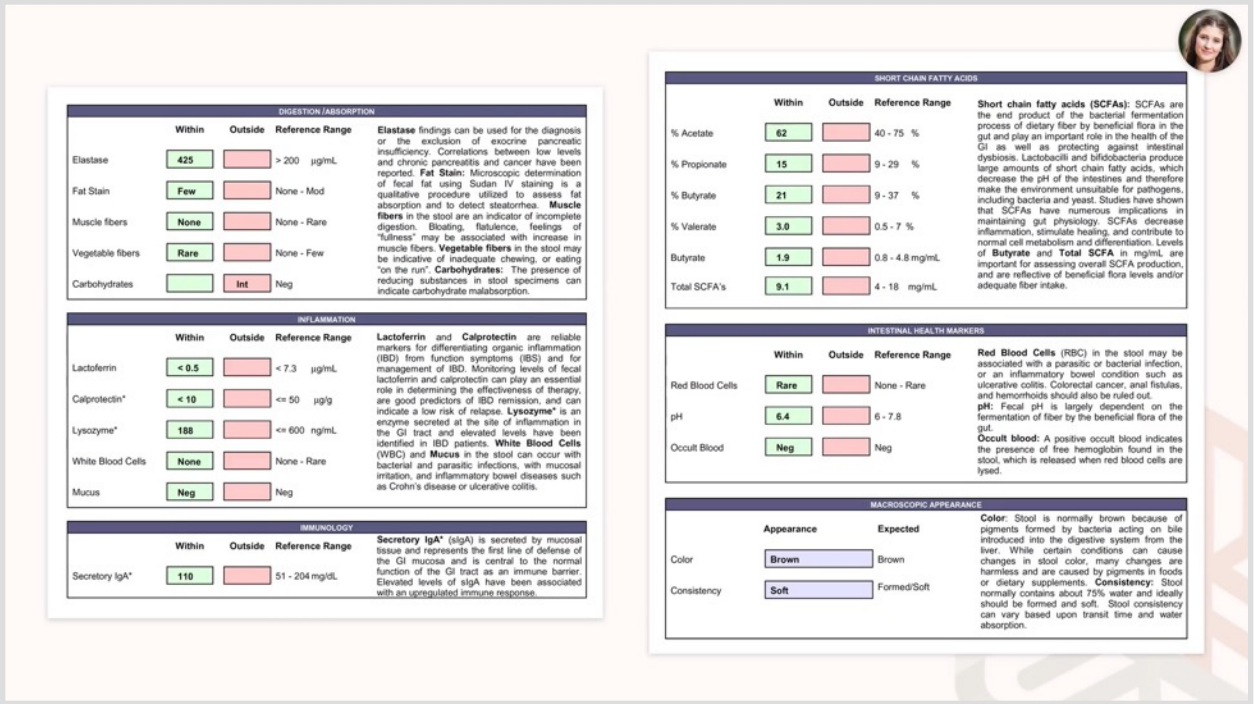
One negative parasitology x1 specimen does not rule out the possibility of parasitic disease, parasitology x3 is recommended. This exam is not designed to detect Cryptosporidium spp, Cyclospora cayetanensis or Microsporidia spp.

GIARDIA/CRYPTOSPORIDIUM IMMUNOASSAY

	Within	Outside	Reference Range
Giardia intestinalis	Neg		Neg
Cryptosporidium	Neg		Neg

Giardia intestinalis (lamblia) is a protozoan that infects the small intestine and is passed in stool and spread by the fecal-oral route. Waterborne transmission is the major source of giardiasis.
Cryptosporidium is a coccidian protozoa that can be spread from direct person-to-person contact or waterborne transmission.

Doctor's Data stool test showed moderate fungal overgrowth on the microscopic section of Candida albicans, a very common species, also picked it up in one of the three stool samples in the microscopy section.



DIGESTION /ABSORPTION

	Within	Outside	Reference Range
Elastase	425		> 200 µg/mL
Fat Stain	Few		None - Mod
Muscle fibers	None		None - Rare
Vegetable fibers	Rare		None - Few
Carbohydrates		Int	Neg

Elastase findings can be used for the diagnosis or the exclusion of exocrine pancreatic insufficiency. Correlations between low levels and chronic pancreatitis and cancer have been reported. **Fat Stain:** Microscopic determination of fecal fat using Sudan IV staining is a qualitative procedure utilized to assess fat absorption and to detect steatorrhea. **Muscle fibers** in the stool are an indicator of incomplete digestion. Bloating, flatulence, feelings of "fullness" may be associated with increase in muscle fibers. **Vegetable fibers** in the stool may be indicative of inadequate chewing, or eating "on the run". **Carbohydrates:** The presence of reducing substances in stool specimens can indicate carbohydrate malabsorption.

INFLAMMATION

	Within	Outside	Reference Range
Lactoferrin	< 0.5		< 7.3 µg/mL
Calprotectin*	< 10		<= 50 µg/g
Lysozyme*	188		<= 600 ng/mL
White Blood Cells	None		None - Rare
Mucus	Neg		Neg

Lactoferrin and **Calprotectin** are reliable markers for differentiating organic inflammation (IBD) from function symptoms (IBS) and for management of IBD. Monitoring levels of fecal lactoferrin and calprotectin can play an essential role in determining the effectiveness of therapy, are good predictors of IBD remission, and can indicate a low risk of relapse. **Lysozyme*** is an enzyme secreted at the site of inflammation in the GI tract and elevated levels have been identified in IBD patients. **White Blood Cells** (WBC) and **Mucus** in the stool can occur with bacterial and parasitic infections, with mucosal irritation, and inflammatory bowel diseases such as Crohn's disease or ulcerative colitis.

IMMUNOLOGY

	Within	Outside	Reference Range
Secretory IgA*	110		51 - 204 mg/dL

Secretory IgA* (sIgA) is secreted by mucosal tissue and represents the first line of defense of the GI mucosa and is central to the normal function of the GI tract as an immune barrier. Elevated levels of sIgA have been associated with an upregulated immune response.

SHORT CHAIN FATTY ACIDS

	Within	Outside	Reference Range
% Acetate	62		40 - 75 %
% Propionate	15		9 - 29 %
% Butyrate	21		9 - 37 %
% Valerate	3.0		0.5 - 7 %
Butyrate	1.9		0.8 - 4.8 mg/mL
Total SCFA's	9.1		4 - 18 mg/mL

Short chain fatty acids (SCFAs): SCFAs are the end product of the bacterial fermentation process of dietary fiber by beneficial flora in the gut and play an important role in the health of the GI as well as protecting against intestinal dysbiosis. Lactobacilli and bifidobacteria produce large amounts of short chain fatty acids, which decrease the pH of the intestines and therefore make the environment unsuitable for pathogens, including bacteria and yeast. Studies have shown that SCFAs have numerous implications in maintaining gut physiology. SCFAs decrease inflammation, stimulate healing, and contribute to normal cell metabolism and differentiation. Levels of **Butyrate** and **Total SCFA** in mg/mL are important for assessing overall SCFA production, and are reflective of beneficial flora levels and/or adequate fiber intake.

INTESTINAL HEALTH MARKERS

	Within	Outside	Reference Range
Red Blood Cells	Rare		None - Rare
pH	6.4		6 - 7.8
Occult Blood	Neg		Neg

Red Blood Cells (RBC) in the stool may be associated with a parasitic or bacterial infection, or an inflammatory bowel condition such as ulcerative colitis. Colorectal cancer, anal fistulas, and hemorrhoids should also be ruled out.
pH: Fecal pH is largely dependent on the fermentation of fiber by the beneficial flora of the gut.
Occult blood: A positive occult blood indicates the presence of free hemoglobin found in the stool, which is released when red blood cells are lysed.

MACROSCOPIC APPEARANCE

	Appearance	Expected
Color	Brown	Brown
Consistency	Soft	Formed/Soft

Color: Stool is normally brown because of pigments formed by bacteria acting on bile introduced into the digestive system from the liver. While certain conditions can cause changes in stool color, many changes are harmless and are caused by pigments in foods or dietary supplements. **Consistency:** Stool normally contains about 75% water and ideally should be formed and soft. Stool consistency can vary based upon transit time and water absorption.

The digestion, absorption, and inflammation immunology short-chain fatty acids and intestinal health markers were all pretty normal, except for carbohydrate malabsorption.

Compounds of Bacterial or Yeast/Fungal Origin

Bacterial - general			
36. Benzoate	<DL*		<= 9.3
37. Hippurate	172		<= 1070
38. Phenylacetate	0.10		<= 0.18
39. Phenylpropionate	<DL*		<= 0.06
40. p-Hydroxybenzoate	0.4		<= 1.8
41. p-Hydroxyphenylacetate	24	H	<= 34
42. Indican	45		<= 90
43. Tricarballylate	0.39		<= 1.41
L. acidophilus / general bacterial			
44. D-Lactate	0.9		<= 4.3
Clostridial species			
45. 3,4-Dihydroxyphenylpropionate	<DL*		<= 0.05
Yeast / Fungal			
46. D-Arabinitol	13		<= 73

Creatinine = 141 mg/dL

* <DL = less than detection limit
** >LIN = greater than linearity limit

Georgia Lab Lic. Code #067-007
CLIA ID# 11D0255349
New York Clinical Lab PFI #4578
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Testing Performed by Genova Diagnostics, Inc. 3425 Corporate Way, Duluth, GA 30096

Laboratory Director: Robert M. David, PhD

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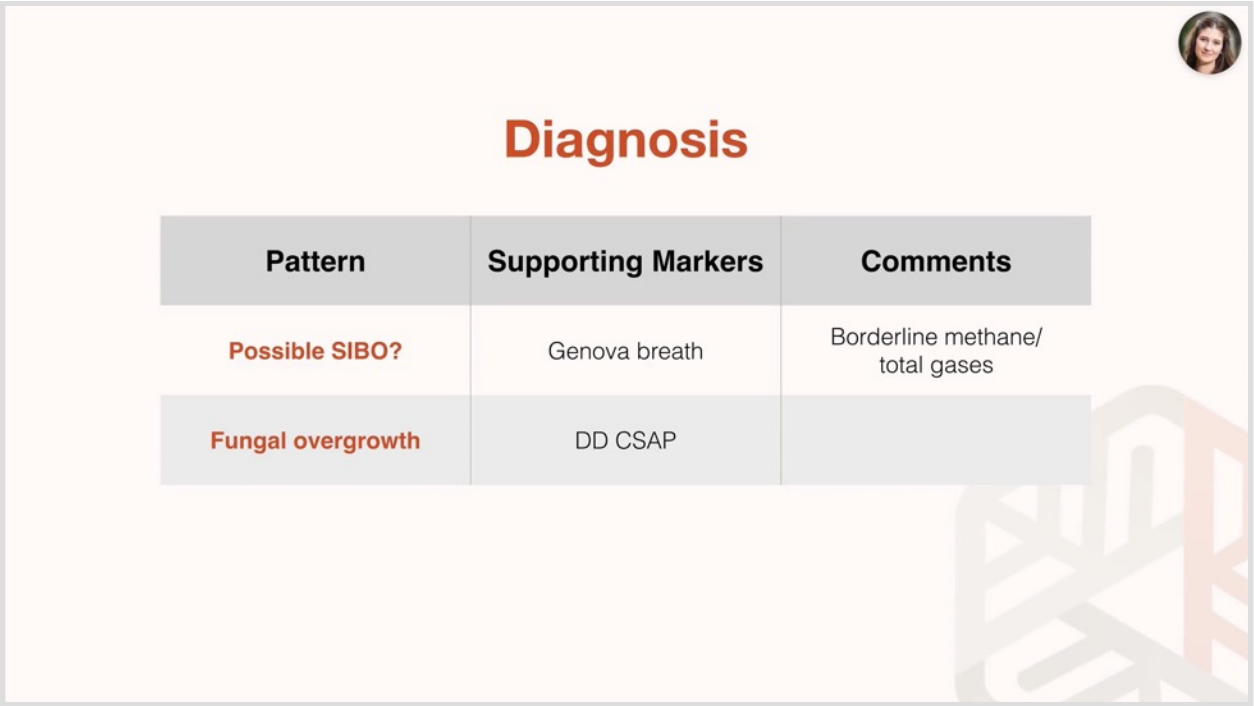
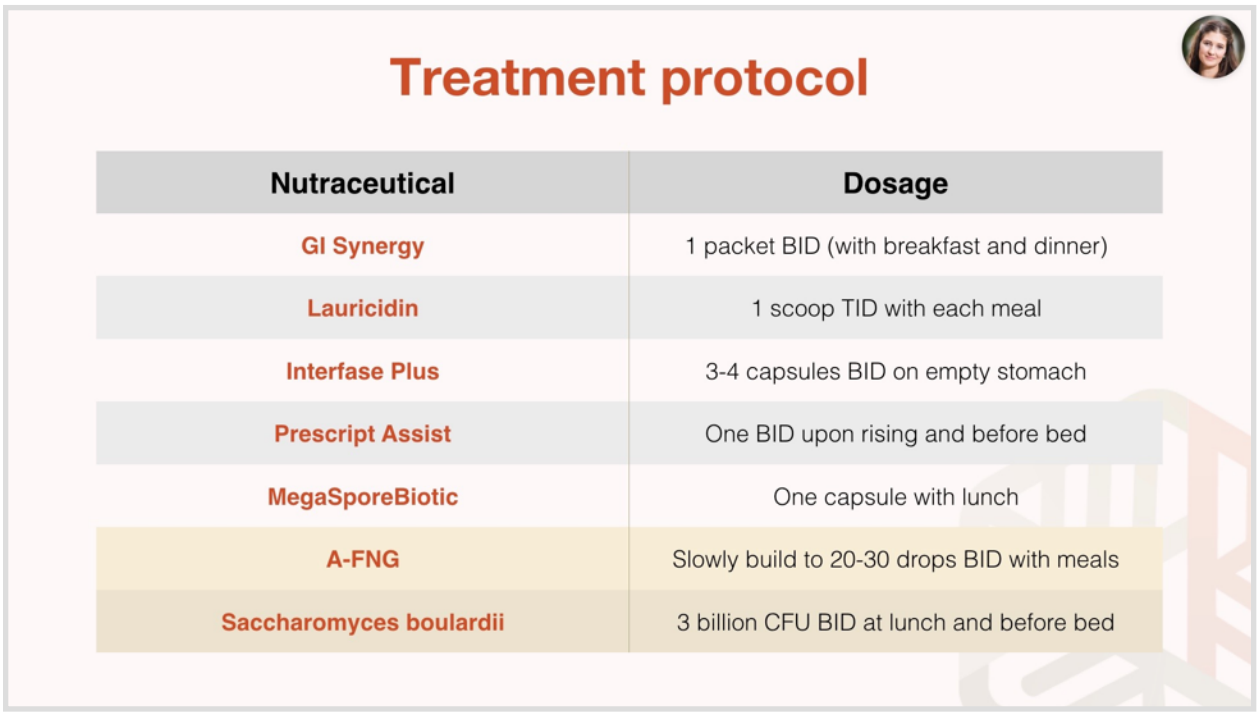
Not much to see on the organic acids test either, other than a high-normal p-hydroxyphenylacetate.



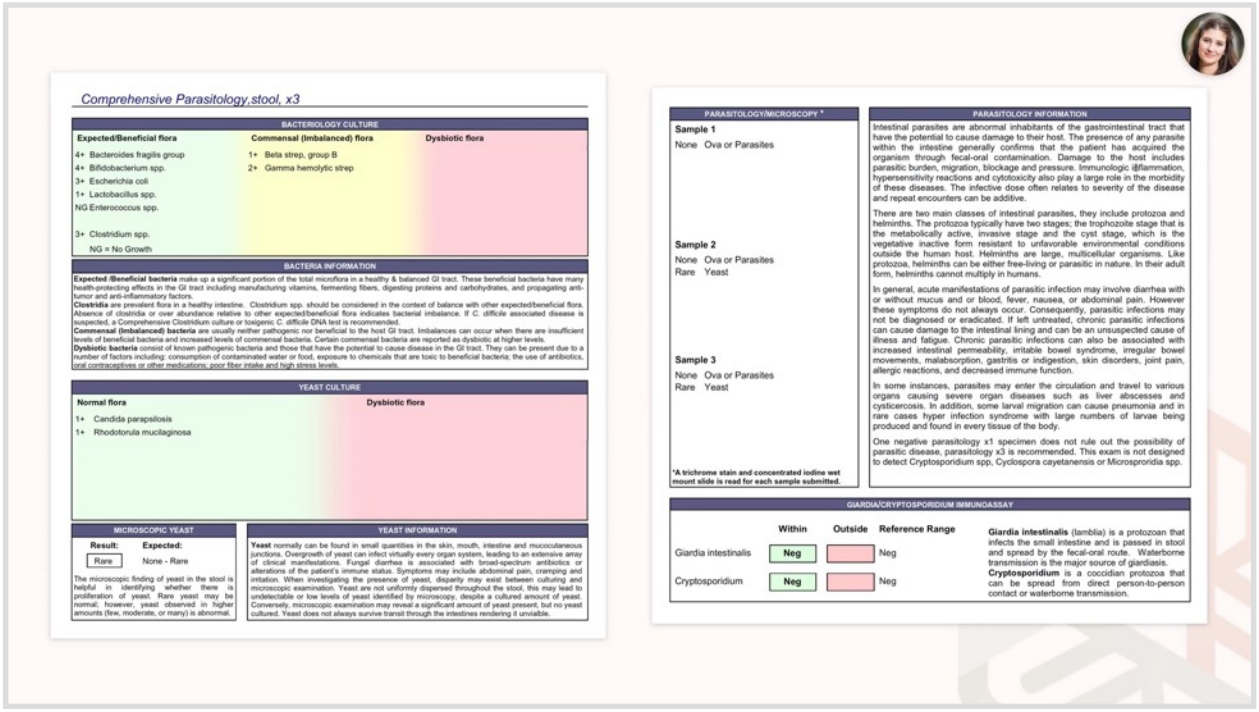
The diagnosis was possible SIBO based on the Genova breath tests, with borderline methane and total gases, and then fungal overgrowth from the Doctor's Data comprehensive stool panel. This was a case where the labs don't perfectly match the patient's symptoms; given her frequent loose stools and other symptoms, you might expect to see labs that looked worse than this. So we always have to remember that ultimately is a clinical diagnosis. We obviously know that something is going on with the patient's gut, or she wouldn't be experiencing the symptoms that she's experiencing. And given that the patient had been struggling for such a long time, she was really eager to treat, so we did go ahead with a protocol.



Treatment protocol

Nutraceutical	Dosage
GI Synergy	1 packet BID (with breakfast and dinner)
Lauricidin	1 scoop TID with each meal
Interfase Plus	3-4 capsules BID on empty stomach
Prescript Assist	One BID upon rising and before bed
MegaSporeBiotic	One capsule with lunch
A-FNG	Slowly build to 20-30 drops BID with meals
Saccharomyces boulardii	3 billion CFU BID at lunch and before bed

I used a core protocol and then added A-FNG and Saccharomyces boulardii for the fungal overgrowth.



Comprehensive Parasitology,stool, x3

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YEAST CULTURE

Normal flora	Dysbiotic flora
1+ Candida parapsilosis	
1+ Rhodotorula mucilaginosa	

MICROSCOPIC YEAST

Result:	Expected:
Rare	None - Rare

The microscopic finding of yeast in the stool is helpful in identifying whether there is proliferation of yeast. Rare yeast may be normal; however, yeast observed in higher amounts (few, moderate, or many) is abnormal.

YEAST INFORMATION

Yeast normally can be found in small quantities in the skin, mouth, intestine and mucocutaneous junctions. Overgrowth of yeast can infect virtually every organ system, leading to an extensive array of clinical manifestations. Fungal diarrhea is associated with broad-spectrum antibiotics or alterations of the patient's immune status. Symptoms may include abdominal pain, cramping and irritation. When investigating the presence of yeast, disparity may exist between culturing and microscopic examination. Yeast are not uniformly dispersed throughout the stool, this may lead to undetectable or low levels of yeast identified by microscopy, despite a cultured amount of yeast. Conversely, microscopic examination may reveal a significant amount of yeast present, but no yeast cultured. Yeast does not always survive transit through the intestines rendering it unviable.

PARASITOLOGY/MICROSCOPY *

Sample 1
None Ova or Parasites

Sample 2
None Ova or Parasites
Rare Yeast

Sample 3
None Ova or Parasites
Rare Yeast

*A trichrome stain and concentrated iodine wet mount slide is read for each sample submitted.

PARASITOLOGY INFORMATION

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GIARDIA/CRYPTOSPORIDIUM IMMUNOASSAY

	Within	Outside	Reference Range
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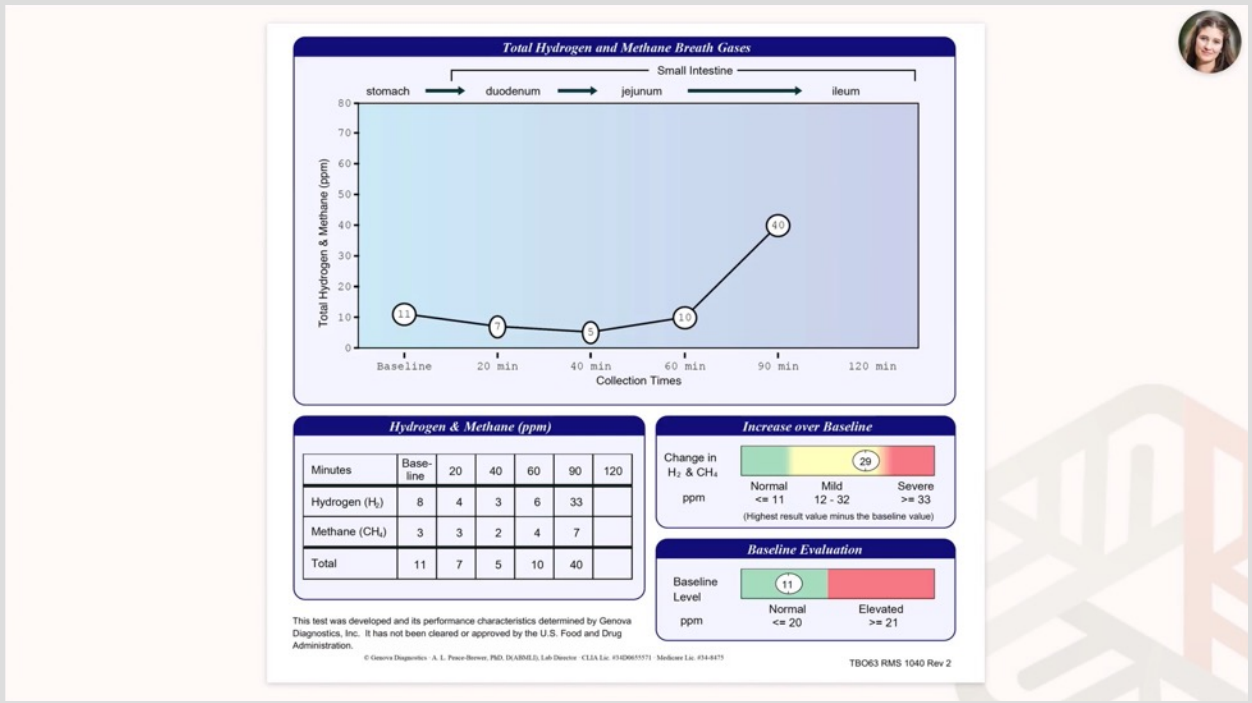
Cryptosporidium	Neg		Neg

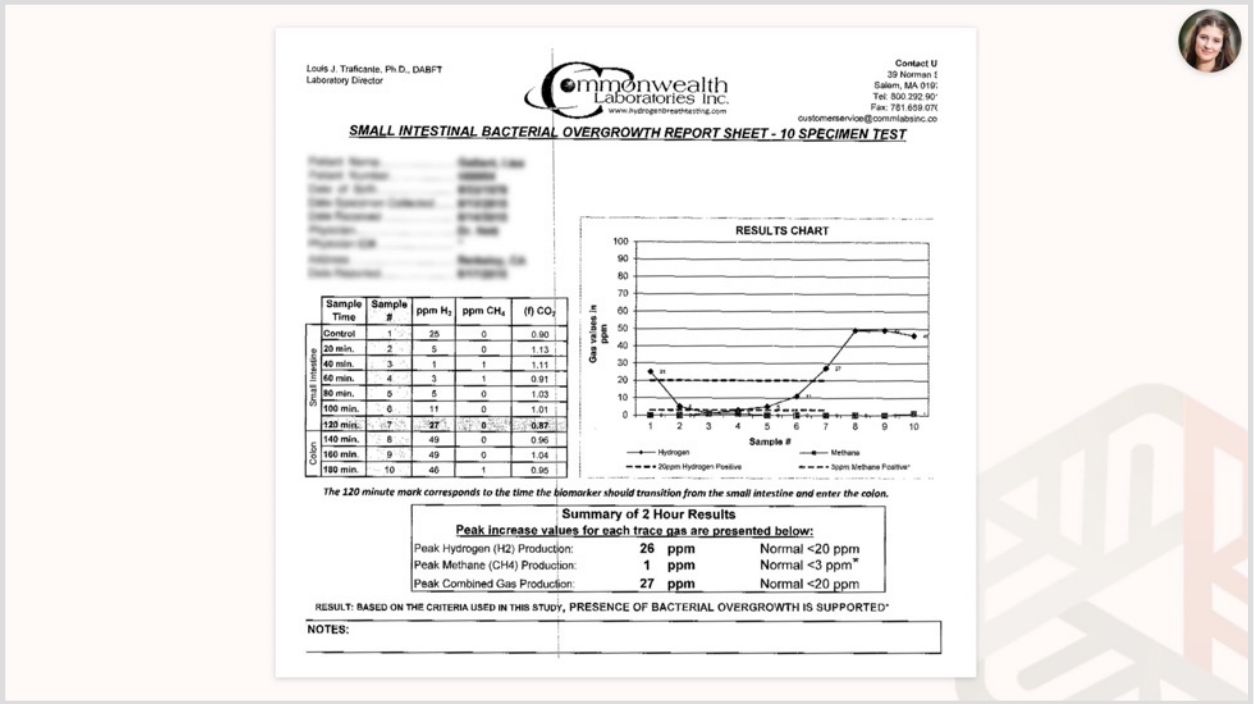
Giardia intestinalis (lamblia) is a protozoan that infects the small intestine and is passed in stool and spread by the fecal-oral route. Waterborne transmission is the major source of giardiasis.
Cryptosporidium is a coccidian protozoa that can be spread from direct person-to-person contact or waterborne transmission.

And here's the retest of her Doctor's Data stool panel. The fungal overgrowth is gone. Note a slight drop in beneficial bacteria, and you can see this even with the botanical protocol. I think it's obviously going to be less pronounced than it would be if you're using broad-spectrum antibiotics,

and I do think that botanical protocols are safer to use for longer-term durations, but they can reduce levels of beneficial bacteria, and patients should not stay on these protocols indefinitely.



Here's the SIBO retest. Again, this is marked positive, but I'm not totally convinced. She had a tendency towards fast transit time and loose stool, and even when her stool isn't loose, she has two to three bowel movements a day, so we talked during the testing section about studies that showed that transit time even in healthy individuals can be as short as 70 minutes from the mouth to the colon, and so she's normal all the way up until 90 minutes, and so it's possible that at that point the substrate had entered the colon. I decided to order a Commonwealth test to clarify the situation, because the Genova test only gives 120 minutes, which is one of the downsides of that test.



Louis J. Trafficante, Ph.D., DABFT
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SMALL INTESTINAL BACTERIAL OVERGROWTH REPORT SHEET - 10 SPECIMEN TEST

[redacted]

	Sample Time	Sample #	ppm H_2	ppm CH_4	(f) CO_2
Small Intestine	Control	1	25	0	0.90
	20 min.	2	5	0	1.13
	40 min.	3	1	1	1.11
	60 min.	4	3	1	0.91
	80 min.	5	5	0	1.03
	100 min.	6	11	0	1.01
	120 min.	7	27	0	0.87
Colon	140 min.	8	49	0	0.96
	160 min.	9	49	0	1.04
	180 min.	10	46	1	0.95

The 120 minute mark corresponds to the time the biomarker should transition from the small intestine and enter the colon.

Summary of 2 Hour Results

Peak increase values for each trace gas are presented below:

Peak Hydrogen (H2) Production:	26 ppm	Normal <20 ppm
Peak Methane (CH4) Production:	1 ppm	Normal <3 ppm*
Peak Combined Gas Production:	27 ppm	Normal <20 ppm

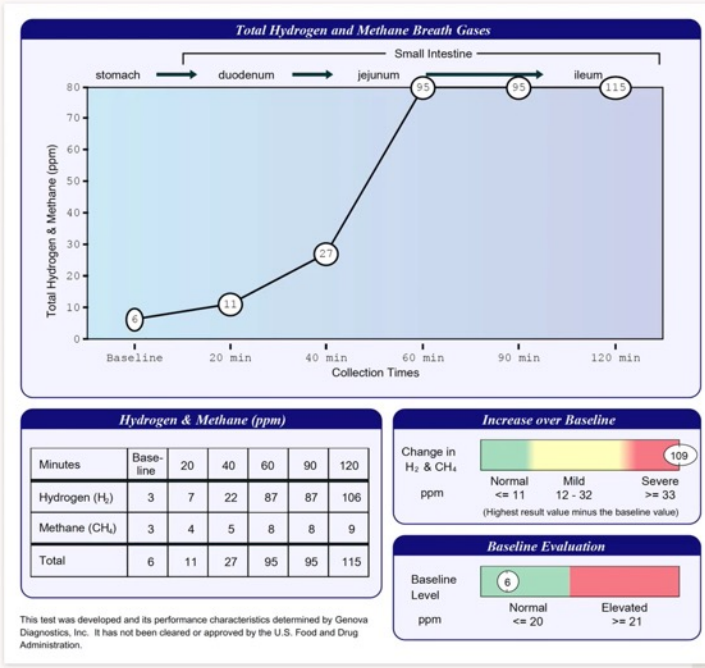
RESULT: BASED ON THE CRITERIA USED IN THIS STUDY, PRESENCE OF BACTERIAL OVERGROWTH IS SUPPORTED*

NOTES:

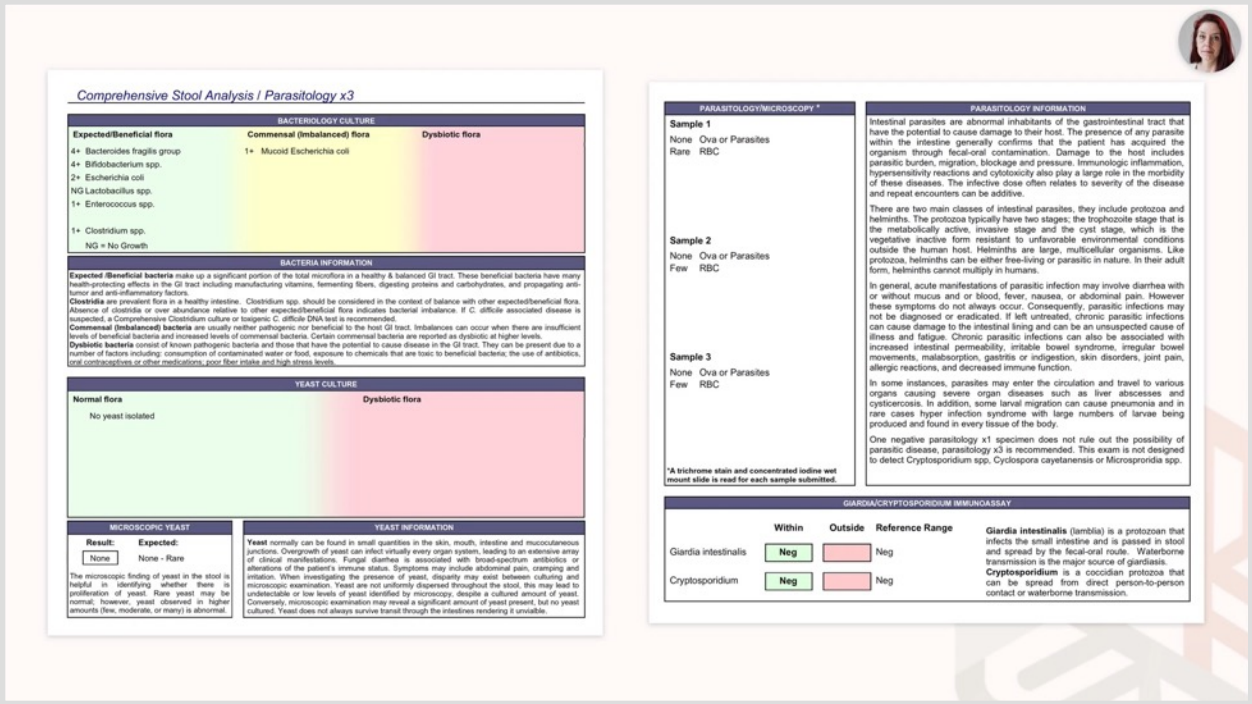
And this is what we found with the Commonwealth test. So there's an initial high value of hydrogen that was likely due to improper test prep or residual fiber in the gut, then it goes right down, and stays low all the way throughout until it starts going up significantly at 100 minutes and then at 120 minutes, so I would call this a late single peak in hydrogen, methane is zero or one throughout. Patient was feeling much better, her gut was feeling great after the treatment, and based on these equivocal results, I didn't feel like further treatment was warranted.

CASE #6: 43-YEAR-OLD FEMALE

All right, next patient: 43-year-old female, chief complaints were mood imbalance, general fatigue, exercise intolerance, she had multiple sclerosis, early stage, low libido, constipation, gas, and bloating. Her MS was relatively well-controlled with the Wahls Protocol, Dr. Terry Wahls, a physician who significantly improved her own MS with a Paleo type of diet, with a particular focus on nutrient density and eating a lot of vegetables, so you can learn more about that just by Googling Wahls Protocol. And prior to 2011, this patient was doing triathlons, eating a lot of gluten and grains, and carb-loading, which is common in endurance athletes on a mostly vegetarian diet, but she crashed with a chronic fatigue episode, switched her diet to Paleo after doing some research after that episode. She had ovarian cancer in her early twenties, and her ovaries were removed in 2000, one in 2000 and another in 2009.



SIBO breath test results, as you can see here, strongly positive, it goes from 7 at 20 minutes to 22 at 40 minutes, and then from 22 to 87 at 60 minutes, and then she's at 106 at 120 minutes, which is off the charts, they just do a flat line at the top there because the chart tops out at 80 parts per million total breath gases. She was constipated with slow transit time, so the hydrogen was almost certainly still in the small intestine when it jumped up there at 60 minutes, and methane was positive according to the Pimentel criteria, although not according to the Quintron criteria.



Comprehensive Stool Analysis / Parasitology x3

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4+ Bifidobacterium spp.		
2+ Escherichia coli		
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1+ Enterococcus spp.		
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YEAST CULTURE

Normal flora	Dysbiotic flora
No yeast isolated	

MICROSCOPIC YEAST

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PARASITOLOGY/MICROSCOPY *

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Rare RBC

Sample 2
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Few RBC

Sample 3
None Ova or Parasites
Few RBC

***A trichrome stain and concentrated iodine wet mount slide is read for each sample submitted.**

PARASITOLOGY INFORMATION

Intestinal parasites are abnormal inhabitants of the gastrointestinal tract that have the potential to cause damage to their host. The presence of any parasite within the intestine generally confirms that the patient has acquired the organism through fecal-oral contamination. Damage to the host includes parasitic burden, migration, blockage and pressure. Immunologic inflammation, hypersensitivity reactions and cytotoxicity also play a large role in the morbidity of these diseases. The infective dose often relates to severity of the disease and repeat encounters can be additive.

There are two main classes of intestinal parasites, they include protozoa and helminths. The protozoa typically have two stages; the trophozoite stage that is the metabolically active, invasive stage and the cyst stage, which is the vegetative inactive form resistant to unfavorable environmental conditions outside the human host. Helminths are large, multicellular organisms. Like protozoa, helminths can be either free-living or parasitic in nature. In their adult form, helminths cannot multiply in humans.

In general, acute manifestations of parasitic infection may involve diarrhea with or without mucus and or blood, fever, nausea, or abdominal pain. However these symptoms do not always occur. Consequently, parasitic infections may not be diagnosed or eradicated. If left untreated, chronic parasitic infections can cause damage to the intestinal lining and can be an unsuspected cause of illness and fatigue. Chronic parasitic infections can also be associated with increased intestinal permeability, irritable bowel syndrome, irregular bowel movements, malabsorption, gastritis or indigestion, skin disorders, joint pain, allergic reactions, and decreased immune function.

In some instances, parasites may enter the circulation and travel to various organs causing severe organ diseases such as liver abscesses and cysticercosis. In addition, some larval migration can cause pneumonia and in rare cases hyper infection syndrome with large numbers of larvae being produced and found in every tissue of the body.

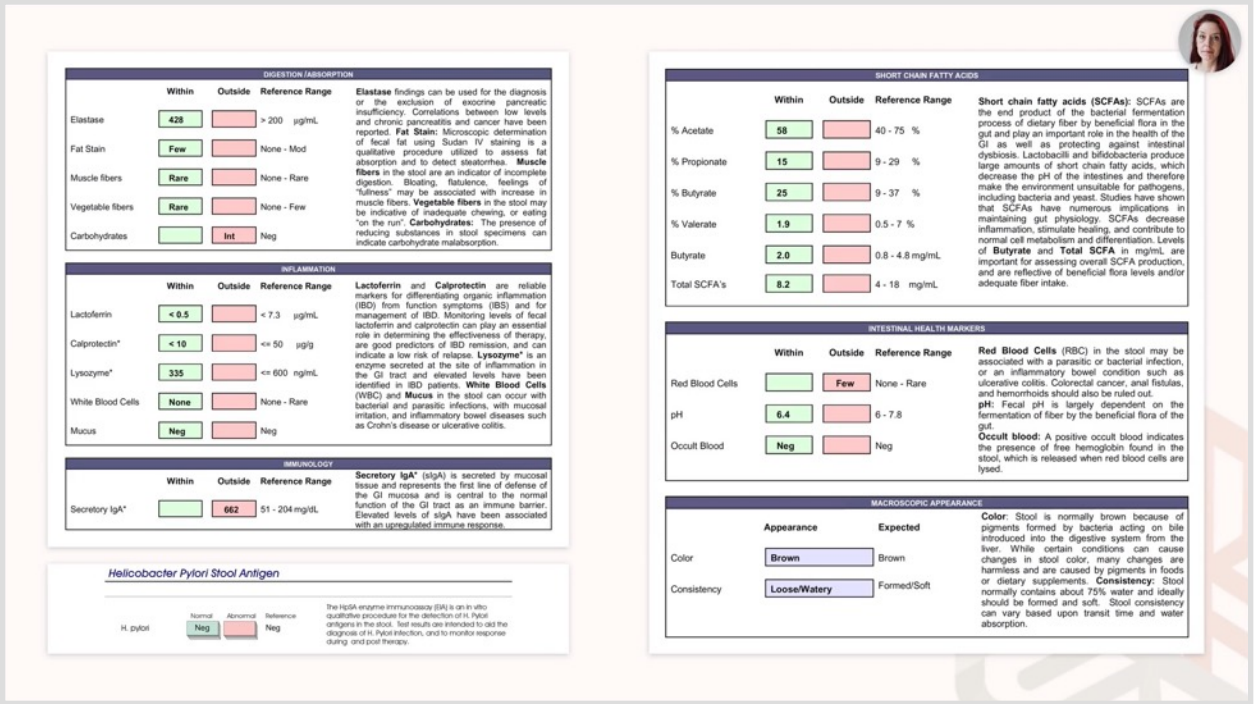
One negative parasitology x1 specimen does not rule out the possibility of parasitic disease, parasitology x3 is recommended. This exam is not designed to detect Cryptosporidium spp, Cyclospora cayetanensis or Microsproridia spp.

GIARDIA/CRYPTOSPORIDIUM IMMUNOASSAY

	Within	Outside	Reference Range
Giardia intestinalis	Neg		Neg
Cryptosporidium	Neg		Neg

Giardia intestinalis (lamblia) is a protozoan that infects the small intestine and is passed in stool and spread by the fecal-oral route. Waterborne transmission is the major source of giardiasis.
Cryptosporidium is a coccidian protozoa that can be spread from direct person-to-person contact or waterborne transmission.

Here's the Doctor's Data stool test. Didn't look too bad, actually, other than no growth of Lactobacillus. I was surprised, based on the SIBO result, but this is a good example, sometimes a problem shows up much more on one test than another.



DIGESTION / ABSORPTION

	Within	Outside	Reference Range
Elastase	428		> 200 µg/mL
Fat Stain	Few		None - Mod
Muscle fibers	Rare		None - Rare
Vegetable fibers	Rare		None - Few
Carbohydrates		Int	Neg

Elastase findings can be used for the diagnosis or the exclusion of exocrine pancreatic insufficiency. Correlations between low levels and chronic pancreatitis and cancer have been reported. **Fat Stain:** Microscopic determination of fecal fat using Sudan IV staining is a qualitative procedure utilized to assess fat absorption and to detect steatorrhea. **Muscle fibers** in the stool are an indicator of incomplete digestion. Bloating, flatulence, feelings of "fullness" may be associated with increase in muscle fibers. **Vegetable fibers** in the stool may be indicative of inadequate chewing, or eating "on the run". **Carbohydrates:** The presence of reducing substances in stool specimens can indicate carbohydrate malabsorption.

INFLAMMATION

	Within	Outside	Reference Range
Lactoferrin	< 0.5		< 7.3 µg/mL
Calprotectin*	< 10		<= 50 µg/g
Lysozyme*	335		<= 600 ng/mL
White Blood Cells	None		None - Rare
Mucus	Neg		Neg

Lactoferrin and **Calprotectin** are reliable markers for differentiating organic inflammation (IBD) from function symptoms (IBS) and for management of IBD. Monitoring levels of fecal lactoferrin and calprotectin can play an essential role in determining the effectiveness of therapy, are good predictors of IBD remission, and can indicate a low risk of relapse. **Lysozyme*** is an enzyme secreted at the site of inflammation in the GI tract and elevated levels have been identified in IBD patients. **White Blood Cells** (WBC) and **Mucus** in the stool can occur with bacterial and parasitic infections, with mucosal irritation, and inflammatory bowel diseases such as Crohn's disease or ulcerative colitis.

IMMUNOLOGY

	Within	Outside	Reference Range
Secretory IgA*		662	51 - 204 mg/dL

Secretory IgA* (sIgA) is secreted by mucosal tissue and represents the first line of defense of the GI mucosa and is central to the normal function of the GI tract as an immune barrier. Elevated levels of sIgA have been associated with an upregulated immune response.

Helicobacter Pylori Stool Antigen

	Normal	Abnormal	Reference
H. pylori	Neg		Neg

The HpSA enzyme immunoassay (EIA) is an in vitro qualitative procedure for the detection of H. Pylori antigens in the stool. Test results are intended to aid the diagnosis of H. Pylori infection, and to monitor response during and post therapy.

SHORT CHAIN FATTY ACIDS

	Within	Outside	Reference Range
% Acetate	58		40 - 75 %
% Propionate	15		9 - 29 %
% Butyrate	25		9 - 37 %
% Valerate	1.9		0.5 - 7 %
Butyrate	2.0		0.8 - 4.8 mg/mL
Total SCFA's	8.2		4 - 18 mg/mL

Short chain fatty acids (SCFAs): SCFAs are the end product of the bacterial fermentation process of dietary fiber by beneficial flora in the gut and play an important role in the health of the GI as well as protecting against intestinal dysbiosis. Lactobacilli and bifidobacteria produce large amounts of short chain fatty acids, which decrease the pH of the intestines and therefore make the environment unsuitable for pathogens, including bacteria and yeast. Studies have shown that SCFAs have numerous implications in maintaining gut physiology. SCFAs decrease inflammation, stimulate healing, and contribute to normal cell metabolism and differentiation. Levels of **Butyrate** and **Total SCFA** in mg/mL are important for assessing overall SCFA production, and are reflective of beneficial flora levels and/or adequate fiber intake.

INTESTINAL HEALTH MARKERS

	Within	Outside	Reference Range
Red Blood Cells		Few	None - Rare
pH	6.4		6 - 7.8
Occult Blood	Neg		Neg

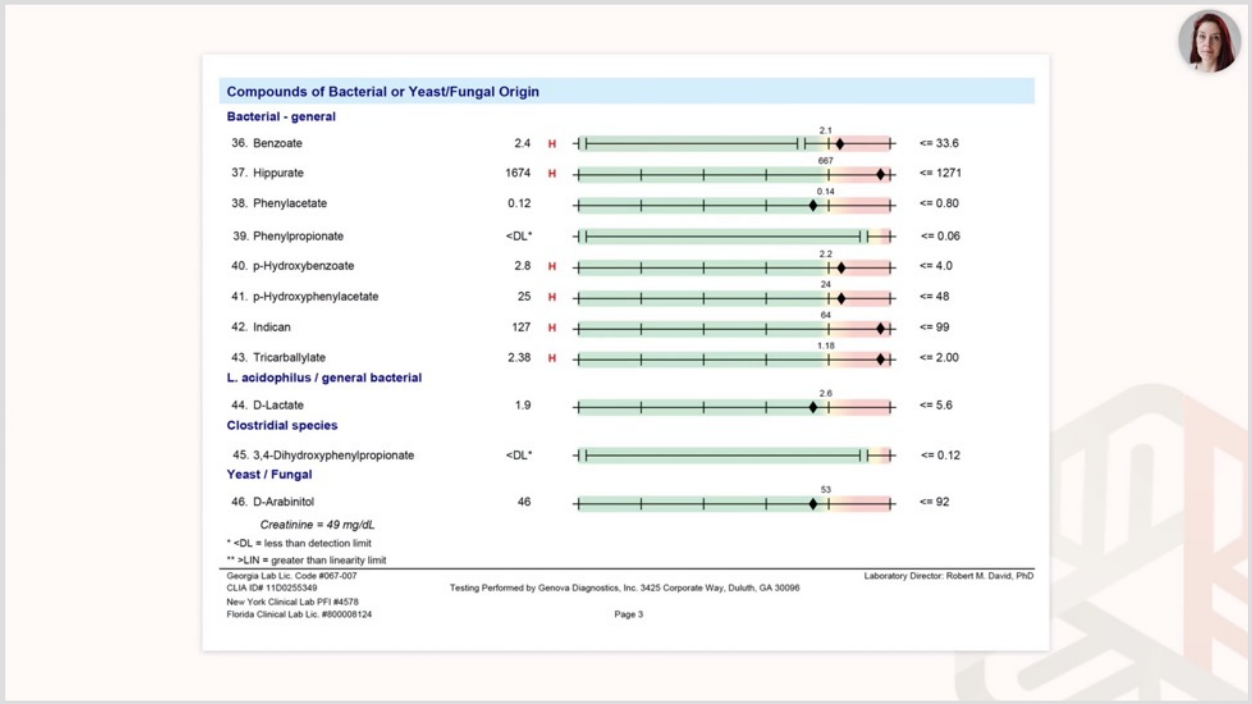
Red Blood Cells (RBC) in the stool may be associated with a parasitic or bacterial infection, or an inflammatory bowel condition such as ulcerative colitis. Colorectal cancer, anal fistulas, and hemorrhoids should also be ruled out.
pH: Fecal pH is largely dependent on the fermentation of fiber by the beneficial flora of the gut.
Occult blood: A positive occult blood indicates the presence of free hemoglobin found in the stool, which is released when red blood cells are lysed.

MACROSCOPIC APPEARANCE

	Appearance	Expected
Color	Brown	Brown
Consistency	Loose/Watery	Formed/Soft

Color: Stool is normally brown because of pigments formed by bacteria acting on bile introduced into the digestive system from the liver. While certain conditions can cause changes in stool color, many changes are harmless and are caused by pigments in foods or dietary supplements. **Consistency:** Stool normally contains about 75% water and ideally should be formed and soft. Stool consistency can vary based upon transit time and water absorption.

The digestion markers, fairly normal except she had carbohydrate malabsorption, but the secretory IgA, look at that, it was over three times higher than the upper end of the limit, it was 662, and then she had red blood cells in her stool indicating inflammatory response. The H. pylori antigen on Doctor's Data was negative.



Compounds of Bacterial or Yeast/Fungal Origin

Bacterial - general			
36. Benzoate	2.4	H	<= 33.6
37. Hippurate	1674	H	<= 1271
38. Phenylacetate	0.12		<= 0.80
39. Phenylpropionate	<DL*		<= 0.06
40. p-Hydroxybenzoate	2.8	H	<= 4.0
41. p-Hydroxyphenylacetate	25	H	<= 48
42. Indican	127	H	<= 99
43. Tricarballylate	2.38	H	<= 2.00
L. acidophilus / general bacterial			
44. D-Lactate	1.9		<= 5.6
Clostridial species			
45. 3,4-Dihydroxyphenylpropionate	<DL*		<= 0.12
Yeast / Fungal			
46. D-Arabinitol	46		<= 92

Creatinine = 49 mg/dL

* <DL = less than detection limit
** >LIN = greater than linearity limit

Georgia Lab Lic. Code #067-007
CLIA ID# 11D0255349
New York Clinical Lab PFI #4578
Florida Clinical Lab Lic. #800008124

Testing Performed by Genova Diagnostics, Inc. 3425 Corporate Way, Duluth, GA 30096

Laboratory Director: Robert M. David, PhD

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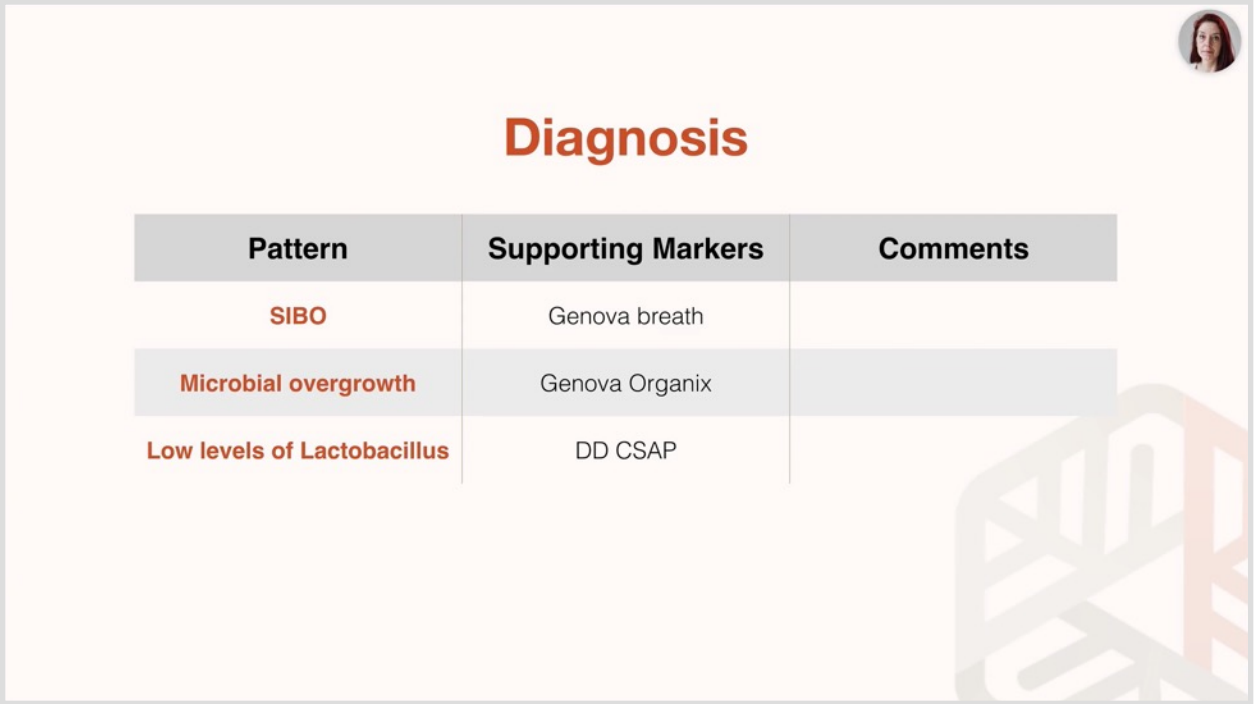
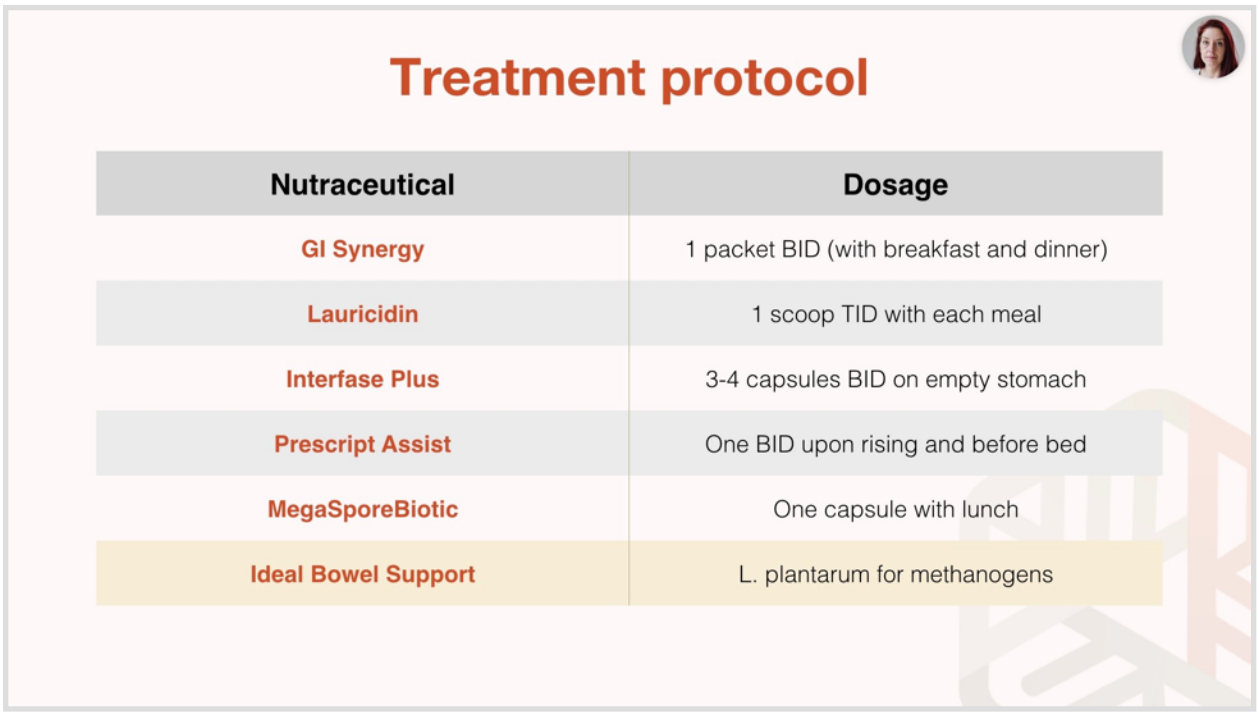
Look at her organic acids results though, she's got a lot going on here, several markers in the high-normal range and some elevated out of the range, definitely supports the idea that something's going on in the small intestine.



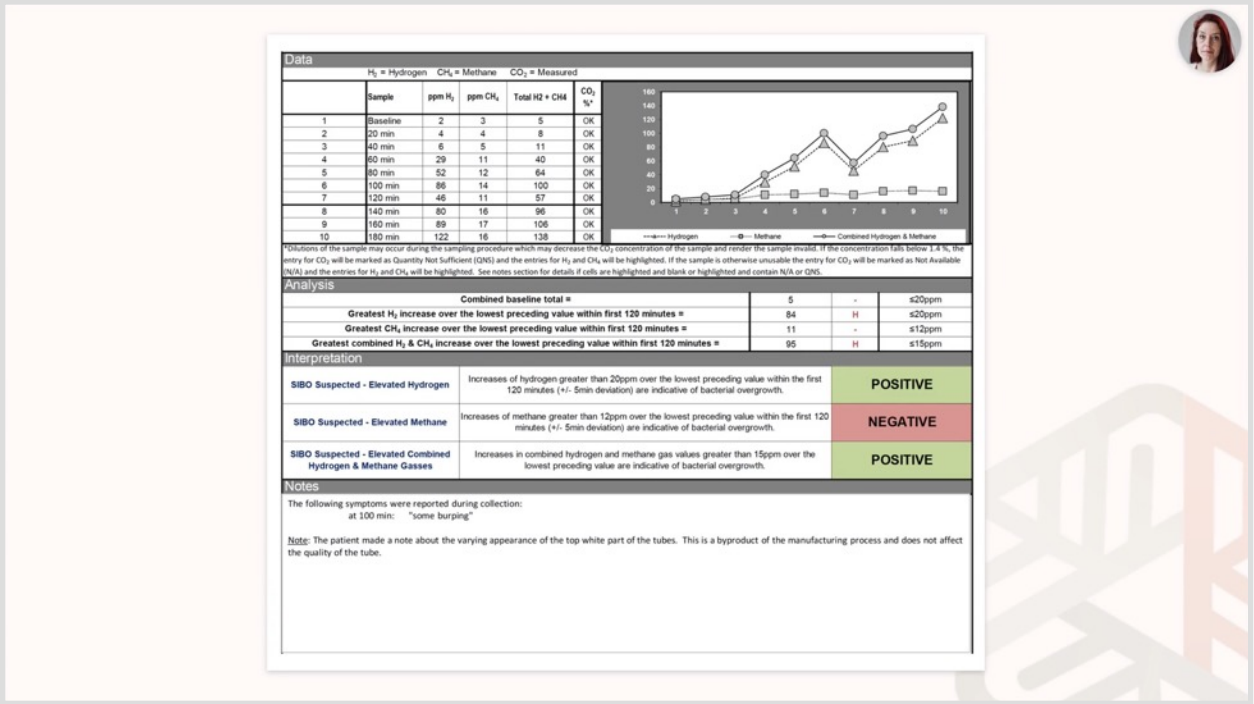
So the diagnosis was SIBO based on the Genova breath results, microbial overgrowth based on the organic acids panel, and then low levels of Lactobacillus on the Doctor's Data stool panel. We didn't have a BioHealth panel for this patient.



Treatment protocol

Nutraceutical	Dosage
GI Synergy	1 packet BID (with breakfast and dinner)
Lauricidin	1 scoop TID with each meal
Interfase Plus	3-4 capsules BID on empty stomach
Prescript Assist	One BID upon rising and before bed
MegaSporeBiotic	One capsule with lunch
Ideal Bowel Support	L. plantarum for methanogens

Here's the protocol: a core protocol plus Lactobacillus plantarum for methanogens and we did 60 days based on the severity of the breath test. You could easily do 90 days even before retesting, but I often like to retest after 60 days, even if I think the treatment's going to go on for longer, so we can make sure we're making progress and we don't have to wait a full three months to find out we're not making progress.



Data

H_2 = Hydrogen CH_4 = Methane CO_2 = Measured

	Sample	ppm H_2	ppm CH_4	Total H2 + CH4	CO_2 %*
1	Baseline	2	3	5	OK
2	20 min	4	4	8	OK
3	40 min	6	5	11	OK
4	60 min	29	11	40	OK
5	80 min	52	12	64	OK
6	100 min	86	14	100	OK
7	120 min	46	11	57	OK
8	140 min	80	16	96	OK
9	160 min	89	17	106	OK
10	180 min	122	16	138	OK

*Dilutions of the sample may occur during the sampling procedure which may decrease the CO_2 concentration of the sample and render the sample invalid. If the concentration falls below 1.4 %, the entry for CO_2 will be marked as Quantity Not Sufficient (QNS) and the entries for H_2 and CH_4 will be highlighted. If the sample is otherwise unusable the entry for CO_2 will be marked as Not Available (N/A) and the entries for H_2 and CH_4 will be highlighted. See notes section for details if cells are highlighted and blank or highlighted and contain N/A or QNS.

Analysis

Combined baseline total =	5	-	≤20ppm
Greatest H_2 increase over the lowest preceding value within first 120 minutes =	84	H	≤20ppm
Greatest CH_4 increase over the lowest preceding value within first 120 minutes =	11	-	≤12ppm
Greatest combined H_2 & CH_4 increase over the lowest preceding value within first 120 minutes =	95	H	≤15ppm

Interpretation

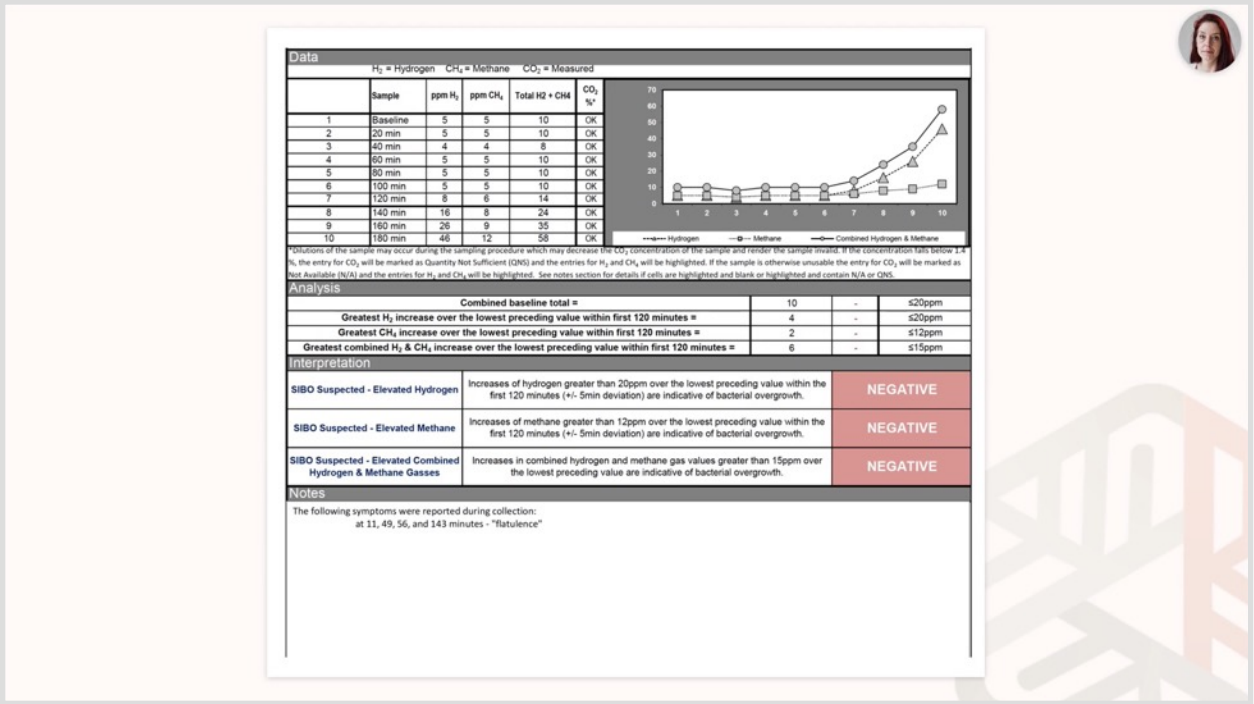
SIBO Suspected - Elevated Hydrogen	Increases of hydrogen greater than 20ppm over the lowest preceding value within the first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth.	POSITIVE
SIBO Suspected - Elevated Methane	Increases of methane greater than 12ppm over the lowest preceding value within the first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth.	NEGATIVE
SIBO Suspected - Elevated Combined Hydrogen & Methane Gasses	Increases in combined hydrogen and methane gas values greater than 15ppm over the lowest preceding value are indicative of bacterial overgrowth.	POSITIVE

Notes

The following symptoms were reported during collection:
at 100 min: "some burping"

Note: The patient made a note about the varying appearance of the top white part of the tubes. This is a byproduct of the manufacturing process and does not affect the quality of the tube.

So here's the retest. Symptoms improved by about 30 to 40 percent with treatment, but follow-up testing did show that she was still positive for SIBO. Not much improvement, though definitely some, it went down from a peak of over 100 to 86, I think, at 100 minutes. As I mentioned in the protocol section, it's not entirely clear why some patients improve significantly on a botanical protocol and others don't. In this case, you could continue with another round of botanicals. As I mentioned before, when I said 60 days, given how severe the gases were, 90 days was my expectation at least, or you could switch to rifaximin plus neomycin if methane is present, and in this case, the patient did want to try rifaximin and neomycin, because she had self-treated with botanical before too and didn't get as much of a response as she was hoping for.



Data

H_2 = Hydrogen CH_4 = Methane CO_2 = Measured

	Sample	ppm H_2	ppm CH_4	Total H2 + CH4	CO_2 %*
1	Baseline	5	5	10	OK
2	20 min	5	5	10	OK
3	40 min	4	4	8	OK
4	60 min	5	5	10	OK
5	80 min	5	5	10	OK
6	100 min	5	5	10	OK
7	120 min	8	6	14	OK
8	140 min	16	8	24	OK
9	160 min	26	9	35	OK
10	180 min	46	12	58	OK

*Dilutions of the sample may occur during the sampling procedure which may decrease the CO_2 concentration of the sample and render the sample invalid. If the concentration falls below 1.4 %, the entry for CO_2 will be marked as Quantity Not Sufficient (QNS) and the entries for H_2 and CH_4 will be highlighted. If the sample is otherwise unusable the entry for CO_2 will be marked as Not Available (N/A) and the entries for H_2 and CH_4 will be highlighted. See notes section for details if cells are highlighted and blank or highlighted and contain N/A or QNS.

Analysis

Combined baseline total =	10	-	≤20ppm
Greatest H_2 increase over the lowest preceding value within first 120 minutes =	4	-	≤20ppm
Greatest CH_4 increase over the lowest preceding value within first 120 minutes =	2	-	≤12ppm
Greatest combined H_2 & CH_4 increase over the lowest preceding value within first 120 minutes =	6	-	≤15ppm

Interpretation

SIBO Suspected - Elevated Hydrogen	Increases of hydrogen greater than 20ppm over the lowest preceding value within the first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth.	NEGATIVE
SIBO Suspected - Elevated Methane	Increases of methane greater than 12ppm over the lowest preceding value within the first 120 minutes (+/- 5min deviation) are indicative of bacterial overgrowth.	NEGATIVE
SIBO Suspected - Elevated Combined Hydrogen & Methane Gasses	Increases in combined hydrogen and methane gas values greater than 15ppm over the lowest preceding value are indicative of bacterial overgrowth.	NEGATIVE

Notes

The following symptoms were reported during collection:
at 11, 49, 56, and 143 minutes - "flatulence"

So we did rifaximin, 1,650 milligrams three times a day plus partially hydrolyzed guar gum for a month, and she did neomycin for the first 10 days of that 30-day period, and here are the follow-up results. Big improvement, you can see the hydrogen didn't go above eight in the first 120 minutes, so that's definitely negative. Her methane is still elevated according to the Pimentel criteria, it was five at baseline and rose to a value of six at 120 minutes, but again, there's not a ton of research; it really just seems to be Dr. Pimentel's clinical observation that suggests anything above three parts per million for methane is problematic. The patient improved really significantly, reported 80 to 90 percent resolution of her main complaints, so we decided not to continue with treatment.