

Gut: Stool Testing – Part 10



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Patient Name					Specimen Number		
[REDACTED]					226-544-9686-0		
Account Number	Patient ID	Control Number	Date and Time Collected	Date Reported	Sex	Age(Y/M/D)	Date of Birth
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TESTS	RESULT	FLAG	UNITS	REFERENCE INTERVAL	LAB
Monocytes(Absolute)	0.4		x10E3/uL	0.1 - 0.9	01
Eos (Absolute)	0.1		x10E3/uL	0.0 - 0.4	01
Baso (Absolute)	0.0		x10E3/uL	0.0 - 0.2	01
Immature Granulocytes	0		%		01
Immature Grans (Abs)	0.0		x10E3/uL	0.0 - 0.1	01
Immunoglobulins A/E/G/M, Serum					
Immunoglobulin G, Qn, Serum	792		mg/dL	700 - 1600	01
Immunoglobulin A, Qn, Serum	184		mg/dL	91 - 414	01
Immunoglobulin M, Qn, Serum	44		mg/dL	40 - 230	01
Immunoglobulin E, Total	93		IU/mL	0 - 100	01

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In this case, I ran this panel for this particular patient, and, as you can see, it was normal. The levels of IgG, IgA, IgM, and IgE all fall within the normal range, so in that case it was not a genetic inability to produce IgA. There was some specific pathology that they were dealing with that was causing that depletion in IgA, and sometimes we see that in cases of fungal overgrowth, as I mentioned before.

Comprehensive Stool Analysis / Parasitology x3

SHORT CHAIN FATTY ACIDS				
	Within	Outside	Reference Range	
% Acetate		29	40 - 75 %	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.
% Propionate	26		9 - 29 %	
% Butyrate		38	9 - 37 %	
% Valerate		7.6	0.5 - 7 %	
Butyrate	2.4		0.8 - 4.8 mg/mL	
Total SCFA's	6.3		4 - 18 mg/mL	

INTESTINAL HEALTH MARKERS				
	Within	Outside	Reference Range	
Red Blood Cells	None		None - Rare	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.
pH	6.7		6 - 7.8	
Occult Blood	Neg		Neg	

Next marker I want to discuss is short-chain fatty acids. So there's a whole section on these on the Doctor's Data stool panel. Short-chain fatty acids are produced by beneficial bacteria in the gut, particularly *Lactobacillus ambiphilic*. They decrease the pH, which is to say they increase the acidity of the colon, and they make an environment that is unsuitable for pathogens like bacteria and yeast. Short-chain fatty acids are the end product of bacterial fermentation of certain carbohydrates, fermentable carbohydrates that are not digested in the small intestine. So this is one reason why I'm always talking about the importance of fermentable carbohydrates, and it's one reason that I'm not a fan of very-low-carb, ketogenic type of diets that remove these carbohydrates over the long term, for most people.

Short-chain fatty acids decrease inflammation, they increase T-regulatory cell production differentiation, which helps balance and regulate the immune system, and they stimulate the growth and repair of enterocytes, which are the cells lining the GI tract. If you see anything out of range in this section, you would consider prebiotics or increasing the patient's intake of fermentable carbohydrates in the diet. The patient on this slide was a 28-year-old female with

SIBO, dysbiosis, and Hashimoto's. And you can see that she's got somewhat aberrant levels of acetate, butyrate, and valerate as percentages of short-chain fatty acids. Butyrate seems to be the most important short-chain fatty acid; at least it's the one that's been the most studied in terms of its benefits. It's powerfully anti-inflammatory, has a significant effect on T-regulatory cell production. Oral supplemental butyrate has actually been used at relatively high doses to treat inflammatory bowel disease, which we'll talk about later. It can be a really important short-chain fatty acid to focus on in the treatment of GI disorders, so if you see low levels of butyrate, there are two things to think about: first is it's an indicator that Bifidobacteria and Lactobacilli are probably low, because they are the bacteria that produce butyrate; and two, like I said, you'd want to be focusing on increasing fermentable carbohydrates to bring that back up.

Comprehensive Stool Analysis / Parasitology x3

SHORT CHAIN FATTY ACIDS				
	Within	Outside	Reference Range	
% Acetate	68		36 - 74 %	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.
% Propionate	15		9 - 32 %	
% Butyrate	15		9 - 39 %	
% Valerate	1.7		1 - 8 %	
Butyrate	2.1		0.8 - 3.8 mg/mL	
Total SCFA's		15	4 - 14 mg/mL	

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

The last markers that we'll discuss on the Doctor's Data panel are for general intestinal health. As we talked about previously, red blood cells are markers of parasitic or bacterial infections, or IBD and colitis. You also want to rule out colorectal cancer, fistulas, and hemorrhoids. pH is largely

dependent on short-chain fatty acid production, so if you've got low fermentation of fiber via beneficial flora of the gut, you'll have a pH that is too alkaline, and that can create an environment that is conducive to overgrowth of harmful bacteria. If you have fungal overgrowth or infections, you'll often see a pH that's lower than it should be. It's too acidic and we see a really strong correlation between that and fungal overgrowth in particular.

Then the last marker is occult blood. This is indicative of free hemoglobin in the stool, which is often caused by bleeding in the gastrointestinal tract. I don't trust this particular marker on Doctor's Data very much. I followed it up in several cases with LabCorp and other labs when it's been positive, and I've sent patients to gastrointestinal docs for their exploration, and in all cases that I can remember, that follow-up testing was negative. So I think there's something about the Doctor's Data methodology that can lead to a false positive result, but given the significance of occult bleed, which can be an indicator of bleeding higher up in the digestive tract caused by an ulcer or possibly cancer, I think it still makes sense to follow up with an occult blood test from LabCorp or Quest, and possibly refer to a gastroenterologist depending on the patient's presentation. So the patient on this slide is a 48-year-old woman with chronic loose stools and fungal overgrowth, and in her case the pH of her stool was normal, but you do see an increase in red blood cell levels, and actually increased levels of short-chain fatty acid, which you can sometimes also see in gut pathologies.

GI Pathogen Screen with H. pylori Antigen - 401H

Parameter	Result
*** Stool Culture ***	
Preliminary Report	Normal flora after 24 hours
Final Report	* Escherichia coli isolated *
Amount of Growth	Abundant
*** Ova & Parasites ***	
Ova & Parasites #1	No Ova/Parasites detected
Ova & Parasites #2	No Ova/Parasites detected
Ova & Parasites #3	* Blastocystis hominis detected *
Ova & Parasites #4	No Ova/Parasites detected
Trichrome Stain	Few protozoan forms of Blastocystis hominis seen on Trichrome Stain
*** Stool Antigens ***	
Cryptosporidium Antigen	Not detected
Giardia lamblia Antigen	Not detected
*** Additional Tests ***	
Fungi	No fungi isolated
C. difficile Toxin A	Not detected
C. difficile Toxin B	Not detected
Yeast	No yeasts isolated
Occult Blood	Not detected
*** Helicobacter Pylori Stool Antigen ***	
H. pylori Antigen	Not detected

I want to finish by looking at some BioHealth results. We focused mostly on the Doctor's Data because it's a much more complicated test with a lot more markers. The BioHealth panel focuses on stool pathogens. There are a couple of things that I want to tell you about that aren't necessarily intuitive, and first is the stool culture section. Most of what's reported is normal growth, but they're not looking down to the genus level in most cases, so for example if they see Enterobacter, which is mostly beneficial but does have some pathogenic species, and can ID under the microscope or can identify that it's not pathogenic, they'll report the genus, which is Escherichia in this case, and the species coli, so E. coli, and then the amount of growth. And most E. coli are beneficial, so the abundant growth that's indicated here on the slide is probably not an issue. If it is pathogenic, they'll put it into the BITEC machine to try to identify the genus as much as they can, but it's not like MALDI-TOF with Doctor's Data. So this section is kind of confusing; it's not clear sometimes whether what's being reported is beneficial or pathogenic, and it's one of the

reasons why I prefer that part of the Doctor's Data test. I don't really pay a lot of attention to this section of the BioHealth test.

GI Pathogen Screen with H. pylori Antigen - 401H

Parameter	Result
*** Stool Culture ***	
Preliminary Report	Normal flora after 24 hours
Final Report	* Klebsiella species isolated *
Amount of Growth	Moderate
*** Ova & Parasites ***	
Ova & Parasites #1	* Entamoeba coli cysts detected *
Ova & Parasites #2	No Ova/Parasites detected
Ova & Parasites #3	No Ova/Parasites detected
Ova & Parasites #4	No Ova/Parasites detected
Trichrome Stain	Few cyst forms of Entamoeba coli seen on Trichrome Stain
*** Stool Antigens ***	
Cryptosporidium Antigen	Not detected
Giardia lamblia Antigen	Not detected
*** Additional Tests ***	
Fungi	No fungi isolated
C. difficile Toxin A	Not detected
C. difficile Toxin B	Not detected
Yeast	No yeasts isolated
Occult Blood	Not detected
*** Helicobacter Pylori Stool Antigen ***	
H. pylori Antigen	Results Pending

This is an example here, these results show moderate growth of Klebsiella, which is routinely found in the human nose, mouth, and GI tract as normal flora, but it can also behave as an opportunistic pathogen. If you see moderate or abundant growth of a species like this, then it might be cause for concern. The same is true for other dysbiotic species like Pseudomonas, Citrobacter, Laribacter, Arcobacter, etc., and if you're in doubt, you can always call the BioHealth client services line, and they can help you out. They're quite helpful in that regard.

Okay, so that's it for stool testing. In the next unit, we're going to discuss breath testing for small intestine bacterial overgrowth. Thanks for watching.