

Hompes Method

Practitioner Training Level II

Lesson Six

Part B - Functional Stool Tests

Functional Lab Tests

- A large array of functional tests is available for the evaluation of digestive health and function. Most doctors don't know about them.
- These tests can evaluate a multitude of parameters that might not even be considered, never mind tested, in the conventional medical setting.

Your Challenge...

“All truth passes through three stages. First, it is ridiculed. Second, it is violently opposed. Third, it is accepted as being self-evident.”

Arthur Schopenhauer – German Philosopher

Functional Lab Tests

- Different types of testing that can provide information about digestion include:
 - Stool (by far the most common)
 - Urine (organic acids is a great test)
 - Blood (albumin, minerals and other markers)
 - Hair (mineral levels)
 - Breath (hydrogen breath test for SIBO)

Stool Tests

- We'll look at stool testing first, as it's far and away the most frequently used type of functional digestive testing. We could spend a full day on stool testing alone because there are so many labs. The easiest way to cover this is for me to share my experience of using several different specific stool tests over the last seven years in practice.

Stool Tests



Stool Tests – Dr. Vasquez

“The single best test for the assessment of gastrointestinal dysbiosis is a comprehensive stool analysis and comprehensive parasitology examination performed by a specialty laboratory that provides bacterial culture, yeast culture, microscopic exam, and measurement of sIgA to assess mucosal immune response, along with markers of inflammation such as lactoferrin, calprotectin, and/or lysozyme. Additional markers can help put microbiological findings into the proper context.”

“These tests should be performed by a specialty laboratory rather than a regular medical or hospital laboratory.”

Stool Tests – Dr. Vasquez

“I consider stool testing extremely valuable and estimate that 80% of parasitology examinations return with at least one clinically-relevant abnormality. Testing for and treating dysbiosis is an absolutely essential consideration in patients with gas, bloating, alternating constipation/diarrhea, irritable bowel syndrome, fibromyalgia, chronic fatigue syndrome, multiple chemical sensitivity, severe allergies, arthritis, and autoimmunity.”

Stool Tests – Liz Lipski

“The most accurate testing is done by laboratories that specialise in parasitology testing.”

Liz Lipski – “The Digestion Connection”

Stool Tests – Great, NOT Perfect

- It's important to shatter the fantasy that the tests performed by speciality labs are perfect. **They're not.** However, they are extremely helpful and will typically provide far more valuable information than similar tests run by the medical system because the test for things the medics don't.

Stool Tests

- Factors to consider when looking at stool testing:
 - 1. How many samples per test?
 - 2. Is care taken over transport / storage?
 - 3. What is the method of analysis?
 - 4. Qualifications / skill level of staff?
 - 5. What are they looking for?

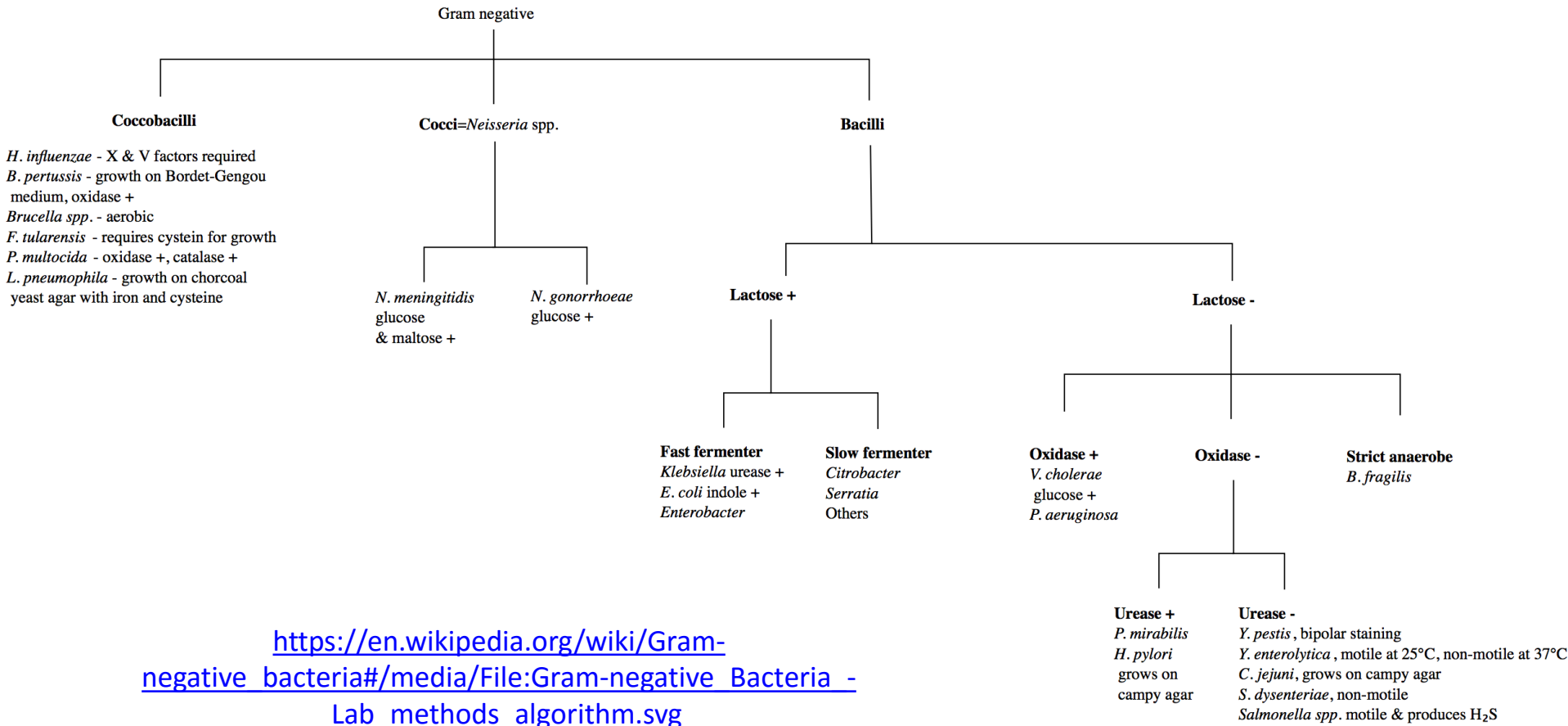
Stool Tests

- Factors to consider when looking at stool testing:
 - Geographical availability
 - Convenience
 - Price
 - Your business model (be careful not to offer something out of either narcissism or altruism)

Stool Tests

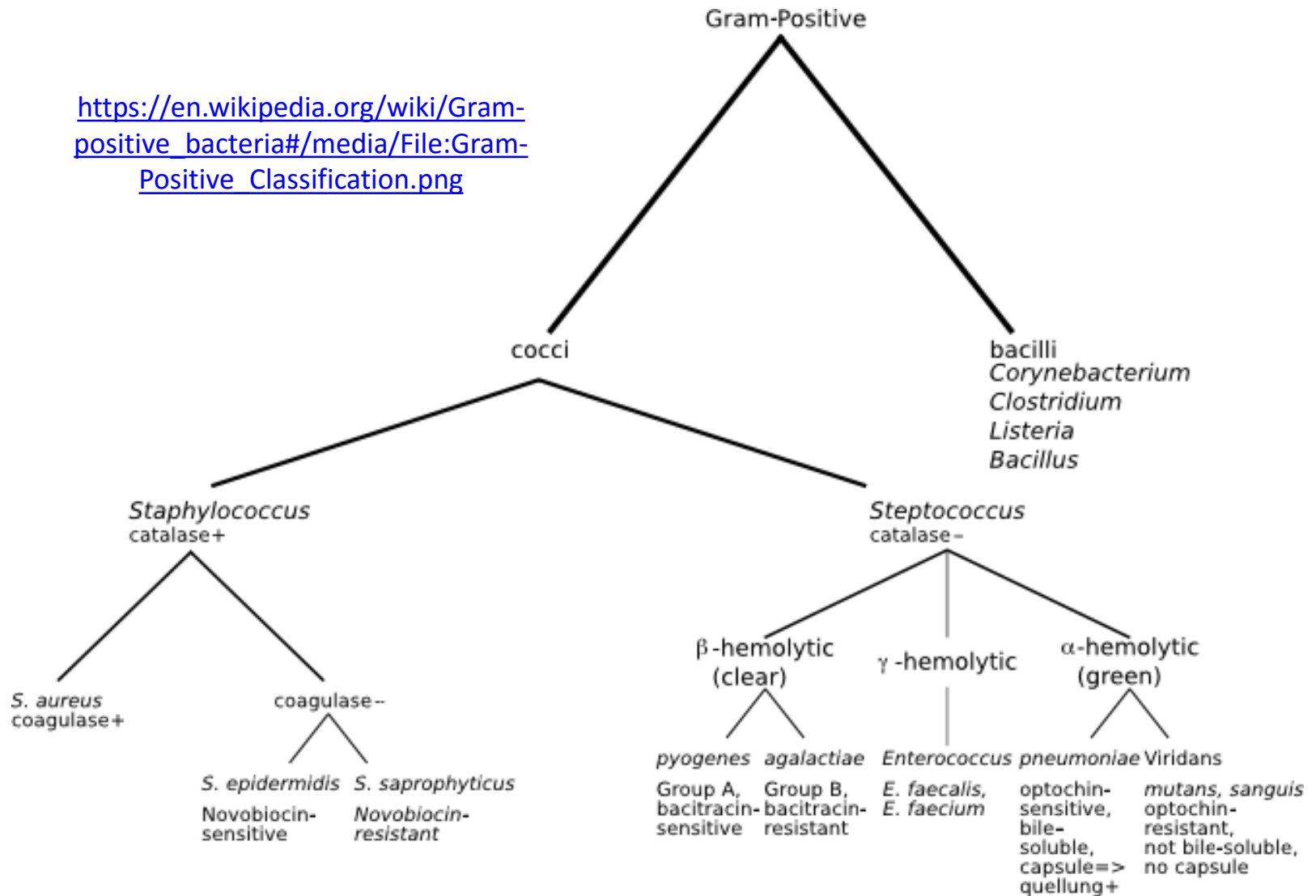
- Factors to consider when looking at stool testing:
 - What is the client/patient eating?
 - Changing the diet in mice changes the flora in a day.
 - What is his/her level of stress?
 - Stress suppresses *Bifidobacteria*, *Lactobacillus* and sIgA
 - Catecholamines stimulate growth of gram negative organisms (some of the nastiest ones – *H. pylori*, *Salmonella*, *E. coli*, *Campylobacter*, *Vibrio*)
 - Anger or fear increases *Bacteroides fragilis*

[Gram Negative Bacteria]



[Gram Negative Bacteria]

https://en.wikipedia.org/wiki/Gram-positive_bacteria#/media/File:Gram-Positive_Classification.png



Stool Tests

- Always remember that you're not playing God with these tests and that you're looking for clues as to how and why your client has become unwell.
- Also remember that one major reason for testing is to get better client/patient compliance.

Biohealth Diagnostics 401H

- The Biohealth 401H test was the first one I used
 - it was the one I was taught to use during my initial functional medicine training with Dr. Kalish.
- 3 samples on separate days
- Bacterial culture
- Ova and parasite evaluation
- *Giardia*, *Crypto*, *E. histo* antigens
- Trichrome stain
- *H. pylori* stool antigen

Biohealth 401H – Sample Report

BIOHEALTH DIAGNOSTICS LABORATORY

Santa Monica, Ca 90404

PATIENT NAME: **HOMPES, DAVID** ACC# 64672 PROVIDER: **HEIDI GRANT**
AGE: 33 COLLECTED: 09/11/08 RECEIVED: 09/22/08 REPORTED: 09/26/08
PROCEDURE NORMAL ABNORMAL UNITS NORMAL RANGE

***** ** STOOL CULTURE FOR PATHOGENS *** *****

SOURCE: STOOL
PRELIMINARY REPORT: NORMAL FLORA AFTER 24 HOURS
FINAL REPORT: KLEBSIELLA SPECIES ISOLATED
AMOUNT OF GROWTH MODERATE

**** STOOL FOR OVA & PARASITES ****

OVA & PARASITES #1 **BLASTOCYSTIS HOMINIS PRESENT**
OVA & PARASITES #2 NO OVA & PARASITES SEEN
OVA & PARASITES #3 **BLASTOCYSTIS HOMINIS PRESENT**
OVA & PARASITES #4 NO OVA & PARASITES SEEN

TRICHROME STAIN (PVA):
FEW PROTOZOAN FORMS OF BLASTOCYSTIS HOMINIS SEEN ON TRICHROME STAIN

***** STOOL ANTIGENS TEST *****

CRYPTOSPORIDIUM AG NOT DETECTED
E. HISTOLYTICA AG. NOT DETECTED
GIARDIA LAMBLIA AG NOT DETECTED

C. DIFFICILE TOXIN A NOT DETECTED
C. DIFFICILE TOXIN B NOT DETECTED

STOOL FOR YEAST **ASPERGILLUS SPECIES ISOLATED**
LIGHT GROWTH

STOOL FOR OCCULT BLOOD NEGATIVE

***** ** HELICOBACTER PYLORI STOOL ANTIGEN *** *****

H. PYLORI STOOL ANTIGEN NOT DETECTED

Biohealth Diagnostics 401H

- I'd say I ran around 50-75 401H's early in my career, and saw results from many other practitioners' tests:
 - It finds a lot of *Blastocystis*, *Crypto*, *Giardia*, *H. pylori* and some yeast overgrowth, but that's about it.
 - The culture results showed a lot of *E. coli* overgrowth (which is false, as I'll explain).
 - I've never seen worms come back on this test.
 - It doesn't have any digestive chemistry markers – it focuses purely on bad bugs.

Biohealth Diagnostics 418

- The 418 is a neat little test that can be used to assess *H. pylori* alone. In essence, it's the “H” from the 401H. It requires just a single stool sample, so it's convenient and relatively inexpensive.

Biohealth Diagnostics

- The problem with Biohealth is that they don't allow you to run stool testing unless you are a licensed practitioner.
- This doesn't mean you can't use the tests, but you'll need to align yourself with a doctor, registered nurse, osteopath or similar.

Metamatrix GI Effects

- Another mentor – Laurent Bannock – persuaded me to try using the GI Effects test from Metamatrix. He and Dr. Kalish had *opposite* experiences and subsequent views of this test and how it compared with the 401H, which was interesting.

Metamatrix GI Effects

- The GI Effects used (and still uses) an analysis method called PCR DNA amplification to detect bad bugs and provide information on good bug levels.

Metamatrix GI Effects

- Dr. Kalish ran some parallel tests using the 401H and GI Effects, and said the 401H won hands down in detecting bad bugs. Laurent did the same thing and told me he'd found the GI Effects to be superior.

Metamatrix GI Effects

- At the time, I called the GI Effects the “Rolls Royce” of digestive testing as it provided such a huge amount of information in a four page report.
- I began finding bugs we hadn’t even covered in my training with Dr. Kalish, including quite a lot of worms and specific opportunistic bacteria such as *Vibrio*, *Salmonella* and *Yersinia*.

Metamatrix GI Effects

- At the time, the GI Effects only needed a single stool sample, which made it very convenient.
- It also assessed a lot of digestive functions in addition to just finding bad bugs.

Metamatrix GI Effects

- I also learned from the Metamatrix training materials exactly why *E. coli* had been showing up all the time in the Biohealth tests.
- It's *because* *E. coli* is aerobic and able to survive in oxygen. When cultured in a lab dish, it grows whereas other bacteria species don't.

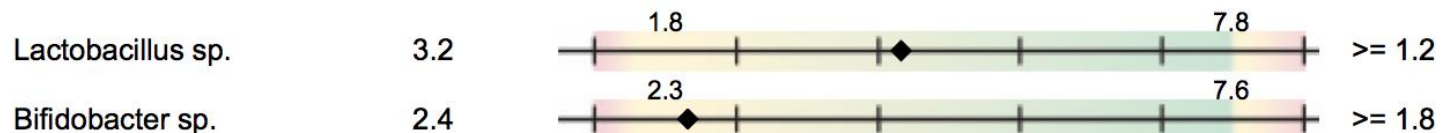
GI Effects Sample Report – Page One

Predominant Bacteria (E+007) E+007

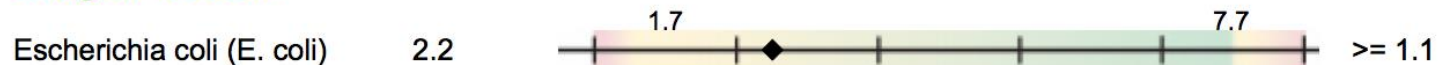
Obligate anaerobes



Facultative anaerobes



Obligate aerobes



Opportunistic Bacteria

No clinically significant amounts.



GI Effects – Page Two

Pathogenic Bacteria		95% Reference Range
Helicobacter pylori	<0.01	<=1.0E+005
E. coli 0157:H7	<0.01	<=1.0E+005
Clostridium difficile	<0.01	<=1.0E+005
Campylobacter sp.	<0.01	<=1.0E+005
Yeast/Fungi		Expected Value
Yeast/Fungi; taxonomy unavailable.		Neg
+3 => 10000 pg DNA/g specimen		

A taxonomy unavailable finding may indicate ingested mold. The higher the number, the greater the indication for treatment, particularly when accompanied by clinical symptoms.

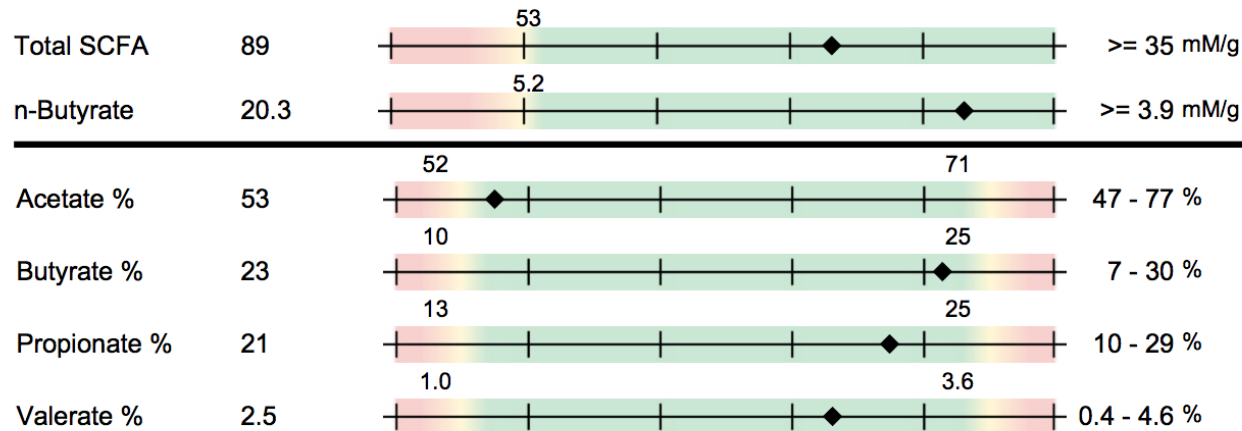
Parasites		Expected Value
Parasite present; taxonomy unavailable.		Neg
Positive		

A taxonomy unavailable finding likely indicates an ingested protozoan and not a human parasite. It does not indicate treatment unless patient symptoms and other inflammatory markers are consistent with parasite infection.

Adiposity Index		
Firmicutes	55	 <= 80
Bacteroidetes	45	 >= 20

GI Effects – Page Three

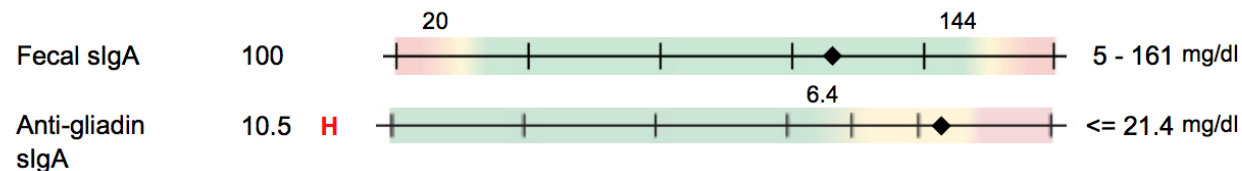
Beneficial SCFA



Inflammation



Immunology






GI Effects – Page Four


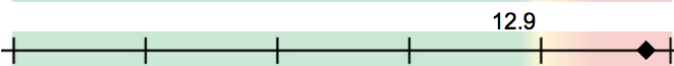

Additional Tests

pH	5.8	L		5.7 - 7.1
RBCs	Neg			Neg
Color	Brown			

Digestion

Elastase 1	482			> 100 ug/g
Triglycerides	123	H		<= 181 mg/dL
Putrefactive SCFA	4.3			<= 7.4 mM/g
Vegetable Fibers	Many			None-Few

Absorption

LCFAs	10.9	H		<= 15.1 mmol/L
Total Fat	18.9	H		<= 18.9 mmol/L
Cholesterol	260	H		<= 191 mg/dL

Metamatrix GI Effects

- In late 2013, Genova Diagnostics bought out / merged with Metamatrix and began making what I felt were unfavourable changes to the test.
 - Removed *H. pylori*, *C. diff*, *E.coli* and *Campylobacter* (and charged extra to add them back in).
 - Increased the test price significantly
 - Reverted to ova and parasite testing for parasites

GI Effects – Game Changed

- I wasn't satisfied with the level of customer care we were given, so I decided to switch labs again. The GI Effects is still available from Genova, and I may switch back to it again at some point because it is a very, very good test.

GI Effects – Game Changed

- Some practitioners struggle to register with Genova – they are quite picky on who they allow to order the testing. This doesn't mean you can't use it, but depending on your qualifications you may benefit from allying with a licensed healthcare professional.

PCI – Dr. Omar Amin

- Dr. Omar Amin is a brilliant parasitologist and has his own labs, one of which is in Scottsdale, AZ. He analyses all samples himself, so we know the quality of analysis is second to none. Being honest, I prefer to have Dr. Amin on the end of the microscope than any of the Genova technicians.
- *PCI = Parasitology Center, Inc.

PCI – Dr. Omar Amin

- Dr. Amin's range of testing is immaculate:
 - Full GI panel (parasites, yeast/fungi, normal *Bacilli*, undigested food, blood, mucus, artifacts, etc.)
 - Swab culture
 - *H. pylori* test
 - Urine test for UTI
 - Additional swab tests (cheek/gum, skin, vagina)
 - Drinking water test for bad bugs

PCI – Dr. Omar Amin

- The biggest disadvantage with the PCI test is that in order to cover everything we were covering with the GI Effects, we needed to run all of the following:
 - The full GI panel
 - Swab culture
 - Separate *H. pylori* test

PCI - Full GI Report

Intestinal Parasites (tested using CONSED Concentration Reagent System, Alpha Tec, Vancouver, WA)

Normal value = 0 parasites - Reference range 0 (negative; not marked) to 4 (very heavy presence)

Protozoan:

<i>Blastocystis hominis</i>	
<i>Entamoeba coli</i> cysts	<i>E. coli</i> trophozoites
<i>E. histolytica</i> / <i>E. dispar</i> cysts	<i>E. histolytica</i> / <i>E. dispar</i> trophozoites
<i>E. hartmanni</i> cysts	<i>E. hartmanni</i> trophozoites
<i>Dientamoeba fragilis</i>	
<i>Iodamoeba butschlii</i> cysts	<i>I. butschlii</i> trophozoites
<i>Endolimax nana</i> cysts	<i>E. nana</i> trophozoites
<i>Giardia lamblia</i> cysts	<i>G. lamblia</i> trophozoites
<i>Chilomastix mesnili</i> cysts	<i>C. mesnili</i> trophozoites
<i>Trichomonas hominis</i>	
<i>Balantidium coli</i> cysts	<i>B. coli</i> trophozoites
<i>Cryptosporidium parvum</i>	
<i>Isospora belli</i>	
<i>Cyclospora cayetanensis</i>	

Trematode (Fluke) Ova:

Schistosoma
Fasciola/Fasciolopsis
Paragonimus westermani
Clonorchis/Heterophyes/Metagonimus

Cestode (Tapeworm) Ova:

Taenia solium/Taenia saginata
Hymenolepis nana
Hymenolepis diminuta
Dipylidium caninum
Diphyllobothrium latum

Nematode (Roundworm) Ova/Larvae:

Ascaris lumbricoides
Ancylostoma/Necator
Strongyloides stercoralis
Trichostrongylus
Trichuris trichiura
Enterobius vermicularis
Mansonella

Fungi Spores and Common Yeasts:

1 <i>Candida</i>	1 <i>Candida</i> (dividing)
<i>Geotrichum</i>	
<i>Kloeckeri</i>	
Hyphae	
1 Yeasts	Yeasts (dividing/pathology)

Other observations on stool sample:

Undigested tissue
Mucus
WBC RBC
Fatty acid crystals
Starch granules
2 Bacteria (normal bacilli)
Pollen
Epithelial (squamous) cells
Epithelial (columnar) cells
Charcot-Leyden crystals*

* (indicates *E. histolytica*; other pathogens possible)

Comments (samples are tested at the Nogales facility):

PCI - Swab Culture Report

Pathogenic Bacteria and Fungi (Positive findings are bolded and marked with a "+")

Common bacterial agents associated with urine and gastrointestinal infections:

Salmonella	Vibrio cholera	Shigella	Yersinia sp.
+Escherichia coli sp	Citrobacter freundii	Campylobacter sp.	Clostridium difficile
Klebsiella sp.	Proteus vulgaris	Proteus Miriabilis	+Candida sp.

Other: **+Pseudomonas aeruginosa spp.**

Common bacterial agents associated with skin, urine, and mucoid surfaces:

Staphylococcus sp.	S. coagulase positive (S. aureus)	S. coagulase negative (S.epidermidis)	
Streptococci	Bacteroides	Candida sp	Pseudomonas sp.

Other:

Sensitivity results range: 1 (most efficacious) – 4 (least efficacious)

Reported pathogens are sensitive to:

(1)Fosfocil	(1)Amikacin	(1)Cipro
(2)Netilmicin	(2)Ceftriaxone	
(3)Gentamicin		
(4)Cefotaxime	(4)Pefloxacin	

PCI - *H. Pylori* Report

Test: _____ ID _____ Pinworm _____ Urine _____ NCS _____ Water _____ x _____ HP

Comments:

Result: 11.0 ng/mL (normal)

Reference: <20.0 ng/mL

PCI Tests - Observations

- We see *E. coli* overgrowth on nearly every test – same problem as Biohealth. Are the other bacterial markers valid?
- The detection of parasites was lower in general than the PCR DNA amplification test (though the latter is associated with false positives).

PCI Tests - Observations

- We have seen some *Ascaris*, which is great, as well as some *Blasto* and *Crypto*. We've seen *Pseudomonas*, *Klebsiella*, *Citrobacter* and *Proteus* on the swab cultures.
- The lack of *H. pylori* showing-up concerns me because a chunk of my business model revolves around *H. pylori*.

Pros and Cons!

- As you can see, each and every test has pros and cons. All the lab companies are doing their best, but there's simply **no such thing as a perfect test.**

DRG Laboratory

- There's yet another twist...
- The microbiologists who introduced and developed the PCR DNA analysis to/for Metamatrix, left Metamatrix after the Genova takeover and developed a brand new test with DRG Laboratory.

DRG Laboratory

- We've been using the DRG test since last October (until present – August 2015). It's been an excellent resource for us, and every Hompes Method practitioner has had the ability to use it.
- HOWEVER, there are still some challenges, which I'll outline shortly.

DRG Laboratory

- It's a single sample test and the turnaround time for results is only 5-7 days, versus 3-4 weeks for some of the other tests.
- It's completely unique in the market place based on because of its special *H. pylori* analysis.

DRG Laboratory – Sample Report

GI Pathogen Plus Profile

Bacteria and Toxins by PCR	Quantitation	Units	Assay Range	Result
C. Difficile - Tox A	51	MFI	10-5000	Negative
C. Difficile - Tox B	50	MFI	10-5000	Negative
Campylobacter	40	MFI	10-5000	Negative
E. coli O157	34	MFI	10-5000	Negative
Enterotoxigenic E. coli (ETEC) LT	32	MFI	10-5000	Negative
Enterotoxigenic E. coli (ETEC) ST	39	MFI	10-5000	Negative
Helicobacter pylori	396	MFI	10-5000	Positive
H. pylori virulence factor cagA	0	MFI	10-5000	Negative
H. pylori virulence factor vacA	88	MFI	10-5000	Negative
H. pylori - Clarithromycin	0	MFI	10-5000	Susceptible
H. pylori stool antigen (IgA)	1	ng/mL		Negative
Salmonella	48	MFI	10-5000	Negative
Shiga Toxin E. coli Stx 1	36	MFI	10-5000	Negative
Shiga Toxin E. coli Stx 2	40	MFI	10-5000	Negative
Shigella	43	MFI	10-5000	Negative
Antibiotic Resistance by PCR *(see comment)	Quantitation	Units	Assay Range	Result
b-Lactamase (bl2b)	775	MFI	10-5000	Resistant
Nitroimidazole (nimD)	41	MFI	10-5000	Susceptible
Fluoroquinolones (qnrA)	16	MFI	10-5000	Susceptible
Tetracycline	17	MFI	10-5000	Susceptible
Imidazole (nimA)	55	MFI	10-5000	Susceptible
Vancomycin (vanA/vanB)	32	MFI	10-5000	Susceptible

DRG Laboratory – Sample Report

Parasites by PCR	Quantitation	Units	Assay Range	Result
Blastocystis hominis	1436	MFI	10-5000	Positive
Entamoeba histolytica	40	MFI	10-5000	Negative
Giardia	24	MFI	10-5000	Negative
Toxocariasis (coming soon)				
Toxoplasma Gondii (coming soon)				
Trichomonas		MFI	10-5000	N/A
Trypanosoma Cruzi (Chagas)		MFI	10-5000	N/A
Fungi by PCR	Quantitation	Units	Assay Range	Result
Aspergillosis (coming soon)				N/A
Blastomycosis (coming soon)				
Candida (albicans tropicalis)	0	MFI	10-5000	Negative

Comments: Information on Specific Testing and Methodologies Utilized

***350 indicates a POSITIVE and equals 100 cells for Bacteria & Toxins. On the Parasites & Fungi it indicates active infection, Morphological stage undetermined**

DRG Laboratory – Sample Report

GI Health Markers	Quantitation	Units	Normal Range	Result
Anti-Gliadin IgA	<0.5	U/mL	0.0-0.5	Normal
Calprotectin	<50.0	µg/g	0.0-50.0	Normal
Elastase (coming soon)				N/A
Fecal Fat	266.15	milliunit/ml	0.00-40.00	High
Fecal Occult Blood				Negative
Lactoferrin	1.20	µg/mL	0.00-7.00	Normal
sIgA1	>5000.00	µg/mL	0.00-1000.00	High
sIgA2	>5000.00	µg/mL	0.00-1000.00	High

DRG Laboratory

- We've seen a lot of *H. pylori* and a lot of Blasto and *Giardia*. These findings have been utterly consistent with client symptoms.
- We've had excellent results using this test and our clients have loved it, mainly due to its simplicity and the fast reporting time.

DRG Laboratory

- For the last 2-3 months we've had some problems with DRG. I won't bore you with details, but politics, problems with lab reporting (odd results that aren't well explained) and customer service are involved.
- For now, they are still our first choice, but there's a new test coming that beats it hands down.

Other Labs

- **Doctors Data** runs a comprehensive GI Panel, which I've never used myself, so can't comment on its performance.
- **Diagnos-Techs** runs a comp. GI Panel, which I used a handful of times early on. It's a decent test but the problems with culturing the stool sample exist.

Stool Testing - PCR vs. Culture

- Single specimen collection
- Copies a single DNA sequence of a viable cell over a billion times within 1-2 hours
- Detects parasites with as few as 5cells/g versus 25,000 cells per/g with microscopic techniques (5,000 times more sensitive)
- Can find lifecycle stages

Stool Testing - PCR vs. Culture

- Ability to ID anaerobic microbes (majority of bacteria – 95%)
- Eliminates errors due to growth in transport (no nutritive broth)
- Requires only 1-5 bacterial cells for ID vs. 1,000-5,000 per culture.
- Greater patient compliance
- Faster delivery of results

[J. Alexander Bralley, PhD Laboratory Examination of Gut Microbiota:
A Clinical Discussion of Molecular (PCR) vs. Culture Techniques]

Stool Testing - PCR vs. Culture

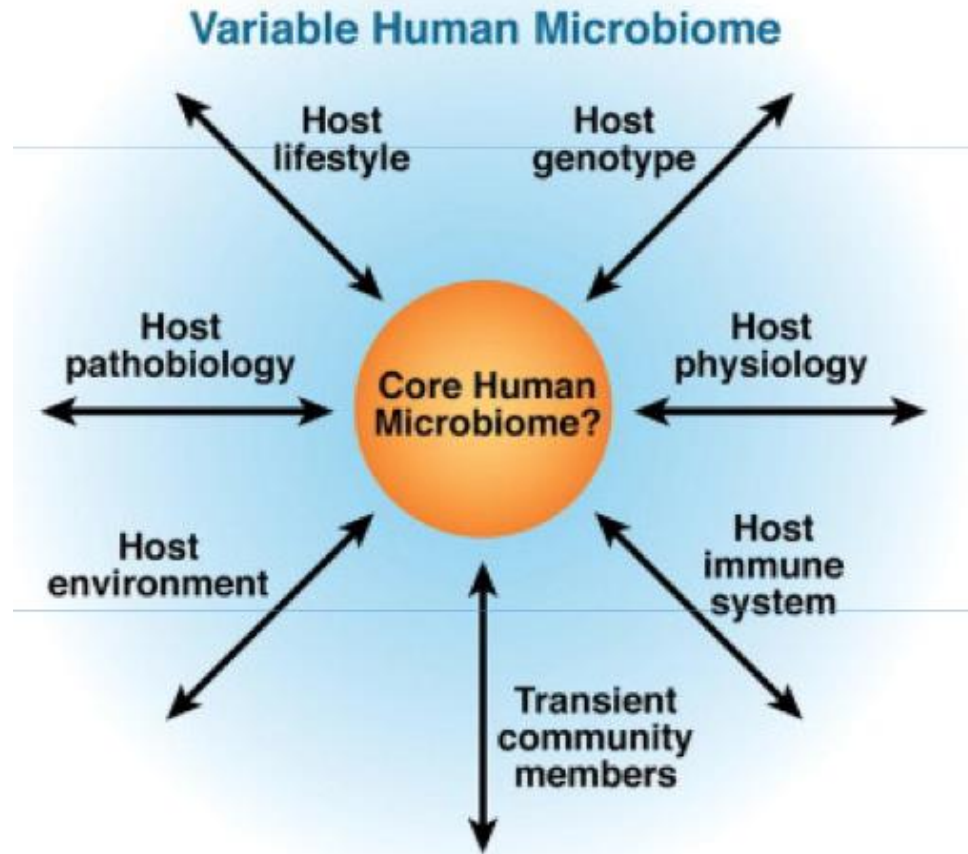
- Higher degree of false positives
- What represents “normal”
 - 12-200x differences in quantities of bacteria between people
 - What should it be?
 - Hunter-gatherers?
 - Cavemen?
- Temporal instability – stress, diet, medications, other illnesses

Stool Testing - PCR vs. Culture

- Analysis of humanized gnotobiotic Mice:
 - Offspring produce similar bacterial diversity as parent
 - Initial colonization is rapidly altered by diet
 - Changing from plant-based diet to high fat/ high sugar diet shifted the census of gut microflora, metabolites, and gene expression in ONE DAY!

Turnbaugh PJ et al. Sci Transl Med 2009;1(6):6ra14.

Stool Testing - PCR vs. Culture



[Patrick Hanaway M.D.
Laboratory Examination of Gut Microbiota:
A Clinical Discussion of Molecular (PCR) vs. Culture Techniques]

Stool Testing Summary

- I've shown you four primary stool testing options, all of which I've used extensively in my own practice.
- My bias is towards the PCI DNA amplification tests as they are more convenient and the results are returned much faster.

Stool Testing Summary

- I'd like to reiterate that one of the main reasons for running stool tests is to motivate/inspire your clients and patients to take action.
- People WANT to be tested because the medical system doesn't help in this area of work.

Stool Testing - Summary

- Hopefully you can see that:
 - Each test has benefits and drawbacks.
 - Each one must be interpreted with a degree of care.
 - Each one must always be placed into the overall clinical context of the patient in front of you.
 - You may be limited in which ones you can use based on your geographical location and qualifications.

Stool Testing - Resources

- GI Effects Interpretive Guide (Metamatrix version)
- GI Effects Interpretive Guide (Genova version).
- “Documented *Limitations of Culture Based Stool Assessment*”.
- Dr. Amin’s article highlighting artifacts that can easily be mistaken for parasites.

Registering with the Labs

- You can register with PCI direct in the US and with PCI Europe in the UK – see specific instructions.
- You can register with DRG Laboratory directly or via Invivo Clinical in the U.K. – see specific instructions.
- You may be able to register with Genova Diagnostics in the US or UK – see specific instructions.

Registering with Labs

- You cannot register with Biohealth Diagnostics for stool or blood testing unless you're a licensed professional, or unless you are working alongside one (I am registered via a chiropractor).
- However, you CAN use their hormone testing, which is discussed in Modules 5 and 6.

Homework

- Please register yourself / your practice with:
 - PCI/PCI Europe
 - Genova Diagnostics
 - DRG/Invivo Clinical

Homework

- If you need help with this process please let us know. As mentioned previously, aligning yourself or your practice with a licensed practitioner may be required (chiropractor, osteopath, dentist, doctor, etc.)

Thank You!

- Thanks for consuming this information. I hope it's been helpful. Please also make sure you look at parts one and three of this lesson to familiarise yourself with all the content in lesson 6 as it is very important.