Comprehensive Stool Analysis (CSA) with Parasitology x3

LAB #: F000000-0000-0
PATIENT: Sample Patient
ID: P00000000
SEX: Male
AGE: 82

CLIENT #: 12345
DOCTOR:
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Comprehensive Stool Analysis / Parasitology x3

BACTERIOLOGY CULTURE

Expected/Beneficial flora	Commensal (Imbalanced) flora	Dysbiotic flora
3+ Bacteroides fragilis group		4+ Klebsiella pneumoniae ssp pneumoniae
NG Bifidobacterium spp.		
NG Escherichia coli		
4+ Lactobacillus spp.		
4+ Enterococcus spp.		
3+ Clostridium spp.		
NG = No Growth		

These are the primary 2 families required for a healthy gut (levels should be 3+ or 4+ for each) - increase via diet, lifestyle & probiotic supplementation

Acceptable organisms (in acceptable numbers) but provide no benefit (indicates an imbalance when present)

*Unacceptable organisms (pathogens) *Consult susceptibility testing when designing eradication strategy*

Preferably around 2+

** Consider The Comprehensive Clostrdium test if no other pathogens detected yet strong gut/ neurological symptoms or high growth (3+ or 4+) for clostridia present*

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
No yeast isolated	

Acceptable yeasts (although assess diet/supplementation/digestion if in excess)

Assesses for all pathogenic yeasts and candida species (eradication and diet protocols might be required - see susceptability testing

MICROSCOPIC YEAST

Result:	Expected:
Many	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 unvialble.

Comments:
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Date Received: 12/2/2011
Date Completed: 12/12/2011

* ***Aeromonas, Campylobacter, Plesiomonas, Salmonella, Shigella, Vibrio, Yersinia, & Edwardsiella tarda*** **have been specifically tested for and found absent unless reported.**

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Unviable yeasts and those that survive in 'pockets' of the GI tract are also tested for here. (A second check. Even if none were cultured)

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PARASITOLOGY/MICROSCOPY *

Sample 1

None Ova or Parasites
Few Yeast

Sample 2

None Ova or Parasites
Mod Yeast

Sample 3

None Ova or Parasites
Rare RBC
Many Yeast

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

The irregular deposition of yeasts is tested for here in multiple samples

(assess diet, immunity, stress and sIgA levels for correlation with this)

Hundreds of potential parasites tested for at multiple stages of their lifecycles here

**Consider the appropriate eradication strategy for any specific organisms detected in any of the samples tested*

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. Factors such as contaminated food and water supplies, day care centers, increased international travel, pets, carriers such as mosquitoes and fleas, and sexual transmission have contributed to an increased prevalence of intestinal parasites. It is estimated that close to one billion people worldwide are infected. 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 that can cause human intestinal disease. 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 that are generally visible to the naked eye in their adult stages. 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.

GIARDIA/CRYPTOSPORIDIUM IMMUNOASSAY

	Within	Outside	Reference Range
Giardia lamblia	Neg		Neg
Cryptosporidium	Neg		Neg

Giardia lamblia is flagellated 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.

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2 of the most common protozoan parasites accurately tested here via immunoassay.
(Consult eradication strategies if detected).

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Indicates competency of digestion of:

DIGESTION /ABSORPTION

	Within	Outside	Reference Range
Elastase	417		> 200 µg/mL
Fat Stain	Few		None - Mod
Muscle fibers	None		None - Rare
Vegetable fibers	Rare		None - Few
Carbohydrates	Neg		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.

Proteins
Fats
Animal proteins
Fibre
Carbohydrates

**Note: Cross-reference each of these markers with any excessive or insufficient intakes of each macro-nutrient in the diet prior to sampling.*

INFLAMMATION

	Within	Outside	Reference Range
Lysozyme*		833	<= 600 ng/mL
Lactoferrin		8.8	< 7.3 µg/mL
White Blood Cells	None		None - Rare
Mucus	Neg		Neg

Lysozyme* is an enzyme secreted at the site of inflammation in the GI tract and elevated levels have been identified in IBD patients. **Lactoferrin** is a quantitative GI specific marker of inflammation used to diagnose and differentiate IBD from IBS and to monitor patient inflammation levels during active and remission phases of IBD. **White Blood Cells** (WBC): in the stool are an indication of an inflammatory process resulting in the infiltration of leukocytes within the intestinal lumen. WBCs are often accompanied by mucus and blood in the stool. **Mucus** in the stool may result from prolonged mucosal irritation or in a response to parasympathetic excitability such as spastic constipation or mucous colitis.

Elevation seen in IBD

Elevated in IBD but NOT IBS, so use as differential indication for IBD

IMMUNOLOGY

	Within	Outside	Reference Range
Secretory IgA*		209	51 - 204mg/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.

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*For Research Use Only. Not for use in diagnostic procedures.

Excessive IgA production can 'deplete' -(and result in low sIgA levels)

**Consider what potential food allergen or intestinal pathogen (especially yeasts) that could be increasing/depleting secretion.*

**Persistent low sIgA levels leave GI tract vulnerable to infection, invasion and systematic inflammation and the development of IgG/E food allergies*

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SHORT CHAIN FATTY ACIDS

	Within	Outside	Reference Range
% Acetate	57		36 - 74 %
% Propionate	17		9 - 32 %
% Butyrate	23		9 - 39 %
% Valerate	2.6		1 - 8 %
Butyrate	1.4		0.8 - 3.8 mg/mL
Total SCFA's	6.0		4 - 14 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.

Sufficient Butyrate is key to colon health

**Proper balance and level of SCFA's suggests correct flora, appropriate diet, & adequate digestion, (and reduced colon cancer risk)*

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.

****The persistent presence of blood in consecutive stool tests indicates referral for endoscopic investigation (as does persistently elevated lactoferrin & lysozyme levels)*

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.

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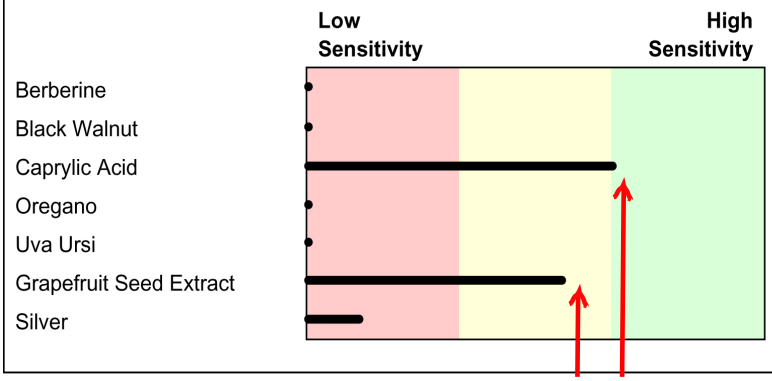
Bacterial Susceptibilities: Klebsiella pneumoniae ssp pneumoniae

NATURAL ANTIBACTERIALS



Natural antibacterial agents may be useful for treatment of patients when organisms display in-vitro sensitivity to these agents. The test is performed by using standardized techniques and filter paper disks impregnated with the listed agent. Relative sensitivity is reported for each natural agent based upon the diameter of the zone of inhibition surrounding the disk. Data based on over 5000 individual observations were used to relate the zone size to the activity level of the agent. A scale of relative sensitivity is defined for the natural agents tested.

Best 'natural' eradication agents for the pathogen detected

PRESCRIPTIVE AGENTS

	Resistant	Intermediate	Susceptible
Amoxicillin-Clavulanic Acid			S
Ampicillin	R		
Cefazolin			S
Ceftazidime			S
Ciprofloxacin			S
Trimeth-sulfa			S

Susceptible results imply that an infection due to the bacteria may be appropriately treated when the recommended dosage of the tested antimicrobial agent is used.
Intermediate results imply that response rates may be lower than for susceptible bacteria when the tested antimicrobial agent is used.
Resistant results imply that the bacteria will not be inhibited by normal dosage levels of the tested antimicrobial agent.

Any Abs in this column are potential eradication agents for the pathogen detected

**NOTE: Agents with the least disruption potential to rest of flora should be considered to be the most desirable to avoid further flora imbalances/infections*

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Natural antibacterial agent susceptibility testing is intended for research use only. Not for use in diagnostic procedures.

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