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P: 1300 688 522 E: info@nutripath.com.au A: PO Box 442 Ashburton VIC 3142 Date of Birth: 01-Jan-1962 Sex: F Collected: 23/Aug/2019 Received: 23-Aug-2019 123 TEST STREET BURWOOD VIC 3125 Lab id: **3629213** UR#: TEST HEALTH CENTRE 123 TEST STREET BURWOOD VIC 3125

COMPLETE DIGESTIVE STOOL ANALYSIS - Level 2

MACROSCOPIC DESCRIPTION					
	Result	Range	Markers		
Stool Colour	Brown	Brown	Colour - Brown is the colour of normal stool. Other colours may indicate abnormal GIT conditions.		
Stool Form	Formed	Formed	Form -A formed stool is considered normal. Variations to this may indicate abnormal GIT conditions.		
Mucous	NEG	<+	Mucous - Mucous production may indcate the presence of an infection, inflammation or malignancy.		
Occult Blood	NEG	<+	Occult Blood - The presence of blood in the stool may indicate possible GIT ulcer, and must always be investigated immediately.		

Macroscopy Comment

BROWN coloured stool is considered normal in appearance.

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MICROSCOPIC DESCRIPTION				
	Result	Range	Markers	
RBCs (Micro)	NEG	<+	RBC(Micro) - The presence of RBCs in the stool may indicate the presence of an infection, inflammation or haemorrhage.	
WBCs (Micro)	0	< 10	WBC(Micro) - The presence of WBCs in the stool may indicate the presence of an infection, inflammation or haemorrhage.	
Food Remnants	+	<++	Food Remnants - The presence of food remnants may indicate maldigestion.	
Fat Globules	+	<+	Fat Globules -The presence of fat globules may indicate fat maldigestion.	
Starch	NEG	<+	Starch - The presence of starch grains may indicate carbohydrate maldigestion.	
Meat Fibres	NEG	<+	Meat Fibres - The presence of meat fibres may indicate maldigestion from gastric hypoacidity or diminished pancreatic output.	
Vegetable Fibres	+	<++	Vegetable Fibres - The presence of vegetable fibres may indicate maldigestion from gastric hypoacidity or diminished pancreatic output.	

Microscopy Comment

FAT GLOBULES PRESENT:

The presence of fat globules in faeces is an indirect indicator of incomplete fat digestion. Consider high dietary fat intake, cholestasis, malabsorption & digestion (diarrhoea, pancreatic or bile salt insufficiency), intestinal dysbiosis, parasites, NSAIDs use, short bowel syndrome, whipples disease, Crohn's disease, food allergies & sensitivities.

Treatment:

- Prebiotic and probiotic supplementation
- Supplement hydrochloride, digestive enzymes or other digestive aids
- Investigate underlying causes
- Investigate food sensitivities and allergies
- Remove potential irritants
- Assess other CDSA markers such as pancreatic elastase 1, calprotectin, & microbiology markers.

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DIGESTIVE AND ABSORPTION MARKERS

Chymotrypsin



Short Chain Fatty Acids, Putrefactive





Long Chain Fatty Acids





Chymotrypsin - Chymotrypsin is involved in protein digestion. Low levels of chymotrypsin may indicate protein maldigestion due to pancreatic insufficiency.

Short Chain Fatty Acids, Putrefactive - Putrefactive SCFAs are produced when anaerobic bacteria ferment undigested protein, indicating protein maldigestion.

Long Chain Fatty Acids - Elevated levels of total LCFAs in the stool may indicate inadequate lipid absorption

Absorption Comment

Chymotrypsin LOW:

Suspect pancreatic insufficiency or hypochlorhydria or slow transit time.

Putrefactive SCFAs are ELEVATED:

Suspect hypochlorhydria, exocrine pancreatic insufficiency, or protein malabsorption. Other causes include bacterial overgrowth of the small bowel, gastrointestinal disease, and/or rapid transit time.

Long Chain Fatty Acids ELEVATED:

Suspect malabsorption, increased mucosal cell turnover, bacterial overgrowth of the small intestine, bile insufficiency.

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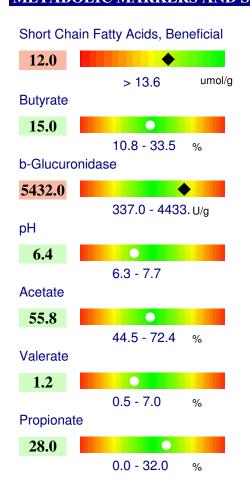


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METABOLIC MARKERS AND SHORT CHAIN FATTY ACIDS



Markers

Short Chain Fatty Acids, Beneficial (Total) - Elevated SCFAs may indicate bacterial overgrowth. Inadequate SCFAs may indicate inadequate normal flora.

Butyrate - Decreased Butyrate levels may indicate inadequate colonic function.

b-Glucuronidase - Increased levels of b-Glucuronidase may reverse the effects of Phase II detoxification processes.

pH - Imbalances in gut pH, will influence SCFA production and effect.

Acetate - Decreased Acetate levels may indicate inadequate colonic function.

Valerate - Decreased Valerate levels may indicate inadequate colonic function.

Propionate - Decreased Propionate levels may indicate inadequate colonic function.

Metabolic Markers Comment

In a healthy gut Short Chain Fatty Acids are exhibited in the following proportions; Butyrate, Acetate, Propionate (16%:60%:24%)

Beneficial SCFAs are LOW:

Also indicated by Lactobacilli <2+, Bifidobacteria <4+, E.coli <4+

Suspect increased susceptibility to pathogenic bacterial infection, increased toxic enzyme exposure, increased risk for mucosal barrier defects and immune dysregulation.

beta GLUCURONIDASE ELEVATED:

Suspect increased activation and enterohepatic recirculation of toxins, hormones, and various drugs within the body. Increased burden on glucuronidation pathway is associated with increased risk of colorectal, prostate and breast cancers.

Treatment:

Consider Calcium-D-glucarate which may assist with lowering B-glucuronidase levels. It is also suggested to introduce a low-calorie/vegetarian diet for 4 weeks which may also be beneficial with lowering faecal B-glucuronidase levels.

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BENEFICIAL BACTERI	A
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	Result	Range	
Bifidobacteria	+	2 - 4 +	
Lactobacilli	+	2 - 4 +	
Eschericia coli	++++	2 - 4 +	
Enterococci	+	1 - 2 +	

COMMENTS:

Significant numbers of Lactobacilli, Bifidobacteria and E coli are normally present in the healthy gut: Lactobacilli and Bifidobacteria, in particular, are essential for gut health because they contribute to 1) the inhibition of gut pathogens and carcinogens. 2) the control of intetinal pH, 3) the reduction of cholesterol, 4) the synthesis of vitamins and disaccharidase enzymes.

OPPORTUNISTIC AND DYSBIOTIC BACTERIA

	Result	Range
Klebsiella	++++	<+++
Citrobacter	++++	<+++
Pseudomonas	NEG	<+++
Proteus	++++	<+++
Campylobacter	NEG	<+
Salmonella	NEG	<+
Streptococcus	++	<+++
Yersinia	NEG	<+
Other Bacteria.	+	<+++

COMMENTS: Commensal 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. A detailed explanation of bacteria that may be present can be found in the Pathogen Summary at the end of this report.

YEASTS

	Result	Range
Candida albicans	++	<+
Geotrichum spp	NEG	<+
Rhodotorula spp	NEG	<+
Other Yeasts	NEG	<+

COMMENTS: Yeast may normally be present in small quantities in the skin, mouth, and intestine. A detailed explanation of yeast that may be present can be found in the Pathogen Summary at the end of this report.

PARASITES

	Result	Range
Blastocystis Hominis	NEG	<+
Dientamoeba fragilis	+	<+
Cryptosporidium	NEG	<+
Giardia lamblia	NEG	<+
Entamoeba Histolytica	NEG	<+
Other Parasites	NEG	<+

COMMENTS: Parasites are organisms that are not present in a normal/healthy GIT. A detailed explanation of parasites that may be present can be found in the Pathogen Summary at the end of this report.

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ANTIBIOTIC SENSITIVITIES and NATURAL INHIBITORS

	Proteus mirabilis	Citrobacter freundii	Klebsiella pneumoniae
Antibiotics	Susceptible	Susceptible	Susceptible
Ampicillin	YES	NO	NO
Augmentin	NO	NO	NO
Ciprofloxacin	NO	YES	YES
Norfloxacin	NO	YES	YES
Meropenem	NO	YES	YES
Cephalothin	NO	NO	NO
Gentamycin.	NO	NO	NO
Trimethoprim/Sulpha	YES	NO	NO
Erythromycin	NO	NO	NO
Penicillin.	NO	NO	NO
Inhibitors	labibition 0/	1 1 1 1 1 1 0 0 0	
Berberine	Inhibition %	Inhibition %	Inhibition % 80.00
Black Walnut	60%	60%	60.00
Caprylic Acid	60%	60%	60.00
Citrus Seed	60%	60%	60.00
Coptis	60%	60%	60.00
Garlic-	60%	60%	60.00
Golden seal	100%	80%	80.00
Oregano	60%	80%	80.00
· ·			
LEGEND Low Inhibition			High Inhibition
0 20	40	60	100

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TEST HEALTH CENTRE 123 TEST STREET **BURWOOD VIC 3125**

YEAST - SENSITIVITIES and NATURAL ANTIFUNGALS

Candida albicans

Antifungals

Inhibition

<=0.5=S Fluconazole

Voriconazole <=0.12=S

Itraconazole

INHIBITION CATEGORY

Resistant This category indicates that the organism is not inhibited by obtainable levels of the pharmaceutical agent Intermediate

This category indicates where the minimum inhibition concentrations (MIC) approach obtainable pharmaceutical

agent levels and for which response rates may be lower than for susceptible isolates

SDD Susceptible. This category indicates that clinical efficay is achieved when higher than normal dosage of a drug is

Dose Dependent used to achieve maximal concentrations

S Susceptible This category indicates that the organisms are inhibited by the usual achievable concentration of the agent NI

No Interpretative This category indicates that there are no established guidelines for MIC interpretatation for these organisams Guidelines

Non-absorbed Antifungals

Inhibition %

Nystatin 60%

Natural Antifungals

Inhibition %

Berberine. 60%

Black Walnut. 60%

Citrus Seed. 60%

Coptis. 60%

Garlic 80%

Golden seal. 80%

Oregano. 80%

LEGEND

High Inhibition Low Inhibition

20 40 60 80 100

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PATHOGEN SUMMARY

OTHER BACTERIA PRESENT:

Organism Result Range Classification
The following group of organisms are deemed commensal, being neither beneficial or pathogenic. Where present, often inadequate levels of beneficial bacteria are also noted. These organisms may become dysbiotic at high levels where treatment may become necessary.

Bacillus species 0 - 3 +Non-Pathogen 0 - 3+ Streptococcus agalactiae Group B 2.+ Non-Pathogen 4+ * H 0 - 3+ POSSIBLE Pathogen Citrobacter freundii 4+ * H 0 - 3+ Klebsiella pneumoniae POSSIBLE Pathogen 4+ * H Proteus mirabilis 0 - 3 +POSSIBLE Pathogen

OTHER YEASTS PRESENT:

OrganismResultRangeClassificationCandida albicans2+ * H0-1+POSSIBLE Pathogen

OTHER PARASITES PRESENT:

Organism Result Range Classification
Dientamoeba fragilis 1+ * H <1+ PATHOGEN

BACILLUS SPECIES:

Bacillus species are spore forming, gram-positive rods belonging to the Bacillaceae family. There are currently 50 valid species within the genus.

Sources:

Meat dishes are a common source of infection in other species of Bacillus such as B. subtilis and B. licheniformis.

Pathogenicity:

As yet, no toxins or other virulence factors have been identified in association with the symptoms that accompany non-B. cereus species.

Symptoms

B. licheniformis and B. subtilis are associated with food-borne diarrheal illness.

Treatment:

B. species is almost always susceptible to clindamycin, erythromycin and vancomycin.

STREPTOCOCCUS:

Description:

Streptococcus is a common isolate from gut flora. With the exception of very rare cases, streptococcus species are not implicated in gastric pathogenesis. However, there has been correlations with the presence of streptococcus pyogenes in patients who have, or have recently had scarlet fever. Streptococcus species are also implicated in urinary tract infections and faecal flora are the common source of contamination for urinary tract infections.

Sources:

Recent infections with streptococcus pyogenes or scarlet fever can be linked to the presence of this species in faeces.

Treatment:

Treatment of streptococcus in gut flora is not always recommended. A practitioner may take into consideration a range of patient factors and symptoms to determine if treatment is necessary.

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CITROBACTER:

Sources:

Common in the environment and may be spread by person-to person contact. Several outbreaks have occurred in babies in hospital units. Isolated from water, fish, animals and food.

Pathogenicity:

Citrobacter is considered an opportunistic pathogen and therefore can be found in the gut as part of the normal flora.

Symptoms:

Citrobacter has occasionally been implicated in diarrheal disease, particularly C. freundii C. diversus and C. koseri

Treatment:

Currently, standard texts provide no specific antimicrobial guidelines for ${\tt GI}$ overgrowth of Citrobacter.

Carbapenems and fluroquinolones are the recommended antibiotics for extraintestinal sites.

KLEBSIELLA:

Sources:

Isolated from foods and environmental sources.

Klebsiella appears to thrive in individuals on a high starch diet.

Avoiding carbohydrates such as rice, potatoes, flour products and sugary foods reduces the amount of Klebsiella in the qut

Pathogenicity:

Part of the normal GI flora in small numbers, but can be an opportunistic pathogen. Klebsiella is capable of translocating from the gut when in high numbers. Certain strains of K. oxytoca have demonstrated cytotoxin production.

Symptoms:

K. pneumoniae and K. oxytoca have been associated with diarrhea in humans. Cytotoxin-producing strains are associated with acute hemorrhagic enterocolitis. Increased colonization of Klebsiella in the stool has been found in HLA-B27 + AS patients.

Treatment:

Currently, standard texts provide no specific antimicrobial guidelines for ${\tt GI}$ overgrowth of ${\tt Klebsiella}$.

Third generation cephalosporins and fluroquinolones are the recommended antimicrobial agents for extra-intestinal sites.

Other Herbal antimicrobials include:

Lemon and clove, Burr marigold, Thyme, Licorice, euphobia, cordyceps.

PROTEUS SPECIES:

Sources:

Food has been implicated as a vehicle of infection.

Pathogenicity:

Part of the normal flora of the GI tract, though has been shown to be an independent causative agent of intestinal disorder

May also play a role as an opportunistic organism in enteric infection due to other pathogens.

Symptoms:

Occasionally implicated in diarrheal disorders.

Recently, it has been suggested that P. mirabilis may be an etiological agent in rheumatoid arthritis.

The mechanism may be related to the molecular cross reactivity between P. mirabilis and the HLA antigens, specifically HLA-DR4.

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Treatment:

Currently, standard texts provide no specific antimicrobial guidelines for GI overgrowth of Proteus.

Ampicillin is recommended for extra-intestinal infections of P. mirabilis, followed by trimethoprim/sulfamethoxazole.

CANDIDA

Sources:

Most sources of Candida infection are thought to be of endogenous origin. While yeast are ubiquitous in the environment and are found on fruits, vegetables and other plant materials, contamination from external sources is linked to patients and health care workers.

Pathogenicity:

A normal inhabitant of the GI tract. May become an opportunistic pathogen after disruption of the mucosal barrier, imbalance of the normal intestinal flora and/or impaired immunity. Risk factors for colonization include: Antibiotics, corticosteroids, antacids, H2 blockers, oral contraceptives, irradiation, GI surgery, Diabetes mellitus, burns, T cell dysfunction, chronic stress and chronic renal disease.

Symptoms:

The most common symptom attributable to non-invasive yeast overgrowth is diarrhea. Symptoms of chronic candidiasis affect four main areas of the body.

- 1. Intestinal system symptoms include: diarrhea, constipation, abdominal discomfort, distention, flatulence and rectal itching.
- 2. Genital Urinary system symptoms include: menstrual complaints, vaginitis, cystitis and urethritis.
- 3. Nervous system symptoms include: severe depression, extreme irritability, inability to concentrate, memory lapses and headaches.
- 4. Immune system symptoms in p@q@^ù\$>0Ù p@q@^ù\$>0Ùclude urticaria, hayfever, asthma, and extep@q@^ù\$>0Ùrnal otitis.

Sensitivities to tobacco, perfumes, diesel fumes and other chemicals.

Treatment:

Currently, standard texts provide no specific antifungal guidelines for GI overgrowth of

Oral azoles have been recommended for extra intestinal infections. Susceptibility testing is advised due to increasing drug resistance.

DIENTAMOEBA FRAGILIS:

It is closely related to Histomonas and Trichomonas species. D. fragilis is known to cause non-invasive diarrheal illness in humans.90% of children are symptomatic, whereas only 15-20% of adults are. The most common symptoms associated with D. fragilis are intermittent diarrhea, fatigue, abdominal pain, fatigue, nausea, anorexia, malaise and unexplained eosinophilia. Diarrhea is predominately seen during the first 1-2 weeks of infection and abdominal pain may persist for 1-2 months.

Treatment:

Iodoquinol (650 mg tid \times 20 days) or Tetracycline (500 mg qid \times 10 days) or Metronidazole (500-750 mg tid \times 10 days) have been used to treat D. fragilis. Another alternative is Paromomycin (500 mg tid \times 7 days).

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The Four "R" Treatment Protocol

	Using a course of antimicrobial, antibacterial, antiviral or anti parasitic therapies in cases where organisms are present. It may	ANTIMICROBIAL ANTIBACTERIAL	Oil of oregano, berberine, caprylic acid Liquorice, zinc carnosine, mastic gum, tribulus, berberine, black walnut, caprylic acid, oil of oregano
REMOVE	also be necessary to remove offending foods, gluten, or	ANTIFUNGAL	Oil of oregano, caprylic acid, berberine, black walnut
REM	medication that may be acting as antagonists.	ANTIPARASITIC	Artemesia, black walnut, berberine, oil of oregano
	Consider testing IgG96 foods as a tool for removing offending foods.	ANTIVIRAL	Cat's claw, berberine, echinacea, vitamin C, vitamin D3, zinc, reishi mushrooms
		BIOFILM	Oil of oregano, protease
REPLACE	In cases of maldigestion or malabsorption, it may be necessary to restore proper digestion by supplementing with digestive enzymes.	DIGESTIVE SUPPORT	Betaine hydrochloride, tilactase, amylase, lipase, protease, apple cider vinegar, herbal bitters
ш	Recolonisation with healthy, beneficial bacteria.	PREBIOTICS	Slippery elm, pectin, larch arabinogalactans
REINOCULA'	beneficial bacteria. Supplementation with probiotics, along with the use of prebiotics helps re-establish the proper microbial balance.	PROBIOTICS	Bifidobacterium animalis sup lactise, lactobacillus acidophilus, lactobacillus plantarum, lactobacillus casei, bifidobacterium breve, bifidobacterium bifidum, bifidobacterium longum, lactobacillus salivarius ssp salivarius, lactobacillus paracasei, lactobacillus rhamnosus, Saccaromyces boulardii
mucosa by gi healthy muco immune supp body health a so as to preve dysfunction.	Restore the integrity of the gut mucosa by giving support to healthy mucosal cells, as well as immune support. Address whole	INTESTINAL MUCOSA IMMUNE SUPPORT	Saccaromyces boulardii, lauric acid
	so as to prevent future GI dysfunction.	INTESTINAL BARRIER REPAIR	L-Glutamine, aloe vera, liquorice, marshmallow root, okra, quercetin, slippery elm, zinc carnosine, Saccaromyces boulardii, omega 3 essential fatty acids, B vitamins
REP/		SUPPORT CONSIDERATION	Sleep, diet, exercise, and stress management

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