NutriPATH
Integrative Pathology Services
P: 1300 688 522
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A: PO Box 442 Ashburton VIC 3142

TEST PATIENT

Date of Birth : 01-Jan-1959
Sex : F
Collected : 9/Aug/2021
Received: 09-Aug-2021

Lab id : **3759086** UR#:

Dr.TEST DOCTOR

TEST HEALTH CENTRE
123 TEST STREET
BURWOOD VIC 3125

COMPLETE DIGESTIVE STOOL ANALYSIS - Level 1

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	**Unformed**	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.

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	+	< +	**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.

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METABOLIC MARKERS

Markers

pH

6.2

6.3 - 7.7

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

Metabolic Markers Comment

LOW pH PRESENT: High Acidity stool.
Consider bacterial overgrowth, lipid or carbohydrate malabsorption, rapid transit time, pancreatic insufficiency.
Treatment:
• Supplement digestive enzymes or other digestive aids
• Assess other CDSA markers such as fat globules, food remnants, transglutaminase IgA & microbiology markers.
• Investigate causes of malabsorption or diarrhoea.

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BENEFICIAL BACTERIA

	Result	Range		Result	Range
Bifidobacterium longum.	2+	2 - 4+	Lactobacillus plantarum	1+ *L	2 - 4+
Bifidobacterium bifidum	1+ *L	2 - 4+	Lactobacillus rhamnosus.	1+ *L	2 - 4+
Bifidobacterium animalis	2+	2 - 4+	Lactobacillus paracasei	2+	2 - 4+
Bifidobacterium pseudocaten.	1+ *L	2 - 4+	Lactobacillus casei	3+	2 - 4+
Bifidobacterium breve	3+	2 - 4+	Lactobacillus acidophilus	2+	2 - 4+
Escherichia coli	3+	2 - 4 +	Enterococci	2+	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 intestinal pH, 3) the reduction of cholesterol, 4) the synthesis of vitamins and disaccharidase enzymes.

PATHOGENIC BACTERIA

Organism	Growth	Range	Classification
Aeromonas species	**NEG**		
Campylobacter	**NEG**		
Salmonella	**NEG**		
Shigella	**NEG**		
Yersinia	**ISOLATED**		
Yersinia_enterocolitica	**1+ *H**	< 1+	Pathogen

COMMENTS:
The above Pathogenic Bacteria are those that have the potential to cause disease in the GI tract. A result of ISOLATED may require a notification to the Department of Health and also cross tested via a secondary method such as PCR or sequencing. Should this be the case, you will also be notified.

OPPORTUNISTIC AND DYSBIOTIC BACTERIA

Organism	Growth	Range	Classification
Klebsiella pneumoniae	**4+ *H**	< 4+	Possible Pathogen
Citrobacter freundii	**2+**	< 4+	Non-Pathogen

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.

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YEASTS

Organism	Growth	Range	Classification
Candida kruseii	2+ *H	NEG - +	Possible Pathogen
Geotrichum spp	1+	NEG - +	Non-Pathogen
Candida albicans	NEG	NEG - +	
Rhodotorula spp	NEG	NEG - +++	
Other Yeasts	NEG	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
Blastocystis Hominis	DETECTED
Dientamoeba fragilis	NOT DETECTED
Cryptosporidium	NOT DETECTED
Giardia lamblia	NOT DETECTED
Entamoeba Histolytica	NOT DETECTED
Other Parasites	NOT DETECTED

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

Antibiotics

	Klebsiella pneumoniae	Citrobacter freundii	Yersinia_enterocolitica
	Susceptible	Susceptible	Susceptible
Amoxicillin	N/A	N/A	N/A
Augmentin	N/A	N/A	N/A
Ciprofloxacin	S	S	N/A
Norfloxacin	S	S	S
Meropenem	S	S	R
Cefazolin	N/A	N/A	N/A
Gentamycin.	N/A	N/A	N/A
Trimethoprim/Sulpha	S	S	R
Erythromycin	N/A	N/A	N/A
Penicillin.	N/A	N/A	N/A

LEGEND

S = Sensitive | R = Resistant | N/A = Not Tested

Inhibitors

	Inhibition %	Inhibition %	Inhibition %
Berberine	80%	60%	80%
Black Walnut	40%	40%	60%
Caprylic Acid	100%	100%	60%
Citrus Seed	40%	40%	60%
Coptis	40%	40%	60%
Garlic-	60%	60%	80%
Golden seal	20%	40%	100%
Oregano	20%	60%	60%

LEGEND

Low Inhibition — High Inhibition

0	20	40	60	80	100

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YEAST - SENSITIVITIES and NATURAL ANTIFUNGALS

Geotrichum spp Candida kruseii

Antifungals

	Inhibition	Inhibition
Fluconazole	256=NI	<=0.5=S
Voriconazole	4.0=NI	<=0.12=S
Itraconazole		

INHIBITION CATEGORY

R	Resistant	This category indicates that the organism is not inhibited by obtainable levels of the pharmaceutical agent
I	Intermediate	This category indicates where the minimum inhibiition concentrations (MIC) approach obtainable pharmaceutical agent levels and for which response rates may be lower than for susceptible isolates
SDD	Susceptible, Dose Dependent	This category indicates that clinical efficay is achieved when higher than normal dosage of a drug is 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 Guidelines	This category indicates that there are no established guidelines for MIC interpreatation for these organisams

Non-absorbed Antifungals

	Inhibition %	Inhibition %
Nystatin	60%	60%

Natural Antifungals

	Inhibition %	Inhibition %
Berberine.	60%	60%
Garlic	40%	40%
Black Walnut.	40%	40%
Citrus Seed.	60%	40%
Coptis.	60%	40%
Golden seal.	60%	40%
Oregano.	40%	40%

LEGEND

Low Inhibition — High Inhibition

0	20	40	60	80	100

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PATHOGEN SUMMARY

YERSINIA SPECIES:

Description:
Yersinia sp. are found naturally in numerous wild and domestic mammals and birds.
Infections may be acquired by ingestion of contaminated food or water, or, rarely by direct person-to person transmission in schools and hospitals.

Yersinia infection has been shown to induce chronic inflammatory bowel disorders such as chronic diarrhea and IBD. Rheumatoid arthritis, reactive arthritis and unspecified arthralgias have also been noted after Yersinia infection.

Treatment:
Intestinal infections with Y. enterocolitica and Y. pseudotuberculosis are usually self limiting and do not require antibiotic therapy. In cases of complicated gastroenteritis, doxycycline or trimethoprim-sulfmethoxazole are the antibiotics of choice.

PLEASE NOTE:
Yersinia detection has been confirmed through a secondary PCR test.
Yersinia is a Notifiable Disease in Queensland, South Australia, Western Australia and Tasmania.
If applicable, the laboratory has notified the relevant state Department of Health.
If applicable, the practitioner is also required to notify the state Dept of Health.

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 gut

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 GI overgrowth of 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.

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 and C. diversus and C. koseri

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Treatment:
Currently, standard texts provide no specific antimicrobial guidelines for GI overgrowth of Citrobacter.
Carbapenems and fluroquinolones are the recommended antibiotics for extraintestinal sites.

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 include urticaria, hayfever, asthma, and external otitis. Sensitivities to tobacco, perfumes, diesel fumes and other chemicals.

Treatment:
Currently, standard texts provide no specific antifungal guidelines for GI overgrowth of Candida.
Oral azoles have been recommended for extra intestinal infections.
Susceptibility testing is advised due to increasing drug resistance.

GEOTRICHUM SPECIES:
Geotrichum are yeast belonging to the Endomyceteaceae family.

Sources:
This organism can be found in soil, dairy products and in human skin and mucosae.

Pathogenicity:
Usually only considered an opportunistic pathogen in immune-compromised hosts. Geotrichum candidum is the etiological agent of Geotrichosis. Geotrichum may also play a role in IBS.

Symptoms:
Symptoms of Geotrichum infection have been associated with diarrhea and enteritis.
Symptoms of Geotrichosis may resemble those of candidiasis.

Treatment:
Currently, standard texts provide no specific antifungal guidelines for GI overgrowth of Geotrichum. Oral azoles and have been recommended for extra intestinal infections. Susceptibility testing is advised owing to increasing drug resistance.

BLASTOCYSTIS HOMINIS:
B. hominis has recently been reclassified as a protozoan, of which there are thought to be four separate serologic groups.

Sources:
This organism is transmitted via the fecal-oral route or from contaminated food or water.
Prevention can be enhanced by improving personal hygiene and sanitary conditions.

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Pathogenicity:
When this organism is present in the absence of any other parasites, enteric organisms or viruses, it may be considered the etiological agent of disease.

Symptoms:
Symptoms can include: diarrhea, cramps, nausea, fever, vomiting and abdominal pain. B. hominis has been associated with irritable bowel syndrome, infective arthritis and intestinal obstruction.

Treatment:
Currently, Metronidazole (Flagyl) is considered the most effective drug (750 mg tid x 10 days).
Iodoquinol (Yodoxin) is also an effective medication (650 mg tid x 20 days).
Recommended therapy can also eliminate G. lamblia, E. histolytica and D. fragilis, all of which may be concomitant undetected pathogens and part of patient symptomology.

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The Four "R" Treatment Protocol

REMOVE	Using a course of antimicrobial, antibacterial, antiviral or anti parasitic therapies in cases where organisms are present. It may also be necessary to remove offending foods, gluten, or medication that may be acting as antagonists. Consider testing IgG96 foods as a tool for removing offending foods.	ANTIMICROBIAL	Oil of oregano, berberine, caprylic acid
		ANTIBACTERIAL	Liquorice, zinc carnosine, mastic gum, tribulus, berberine, black walnut, caprylic acid, oil of oregano
		ANTIFUNGAL	Oil of oregano, caprylic acid, berberine, black walnut
		ANTIPARASITIC	Artemesia, black walnut, berberine, oil of oregano
		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
REINOCULATE	Recolonisation with healthy, beneficial bacteria. Supplementation with probiotics, along with the use of prebiotics helps re-establish the proper microbial balance.	PREBIOTICS	Slippery elm, pectin, larch arabinogalactans
		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
REPAIR & REBALANCE	Restore the integrity of the gut mucosa by giving support to healthy mucosal cells, as well as immune support. Address whole body health and lifestyle factors so as to prevent future GI dysfunction.	INTESTINAL MUCOSA IMMUNE SUPPORT	Saccaromyces boulardii, lauric acid
		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
		SUPPORT CONSIDERATION	Sleep, diet, exercise, and stress management