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25243-0001

Dr Test Doctor (Test Doctor) Test Clinic. 123 Test Street, Test

Lab ID
Patient ID PAT-100009
Ext ID 25243-0001

Test Patient

Sex: Male 45yrs 01-Jan-80
123 Home Street, Test

RECEIVED
31-Aug-25

GI-Advanced

Specimen type - Stool

Collected
27-Aug-25

MACROSCOPIC EXAMINATION

TEST	RESULT
Stool Colour	Green
Stool Form	Unformed
Mucous	PRESENT

OCCULT BLOOD

TEST	INTERPRETATION
Occult Blood	POSITIVE

GIT FUNCTIONAL MARKERS

TEST	RESULT	H/L	REFERENCE	UNITS
Calprotectin	78.0	H	(<100.0)	ug/g
b-Glucuronidase	6850	H	(368-6266)	U/g
Pancreatic Elastase 1	410		(>200)	ug/g
pH	6.2	L	(6.3-7.7)	
Secretory IgA	350	L	(200-1300)	ng/mL
Steatocrit	18.0	H	(<10.0)	%
Transglutaminase IgA	122.0	H	(<100.0)	ug/g
Zonulin	122	H	(<120)	ng/mL

SHORT CHAIN FATTY ACIDS

TEST	RESULT	H/L	REFERENCE	UNITS
Short Chain Fatty Acids, Beneficial	12.2	L	(>13.6)	umol/g
Acetate	56.00		(44.00-72.00)	%
Butyrate	24.00		(10.00-33.00)	%
Propionate	13.00		(0.00-32.00)	%
Valerate	7.00		(0.50-7.00)	%

Parasites & Worms

Ascaris species, Roundworm
Blastocystis hominis
Giardia intestinalis

Bacteria & Viruses

Campylobacter species
Desulfovibrio piger
Fusobacterium species
Helicobacter pylori
Klebsiella pneumoniae complex
Methanobrevibacter smithii
Pseudomonas aeruginosa
Rotavirus A

Mycology

Candida albicans
Candida parapsilosis

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PARASITES

TEST	RESULT	H/L	REFERENCE	UNITS
Blastocystis hominis	1.0	H	(<1.00)	x10^5 org/g
Cryptosporidium species	<DL		(<1.00)	x10^5 org/g
Dientamoeba fragilis	<DL		(<1.00)	x10^5 org/g
Entamoeba histolytica	<DL		(<1.00)	x10^5 org/g
Giardia intestinalis	1.0	H	(<1.00)	x10^5 org/g
Cyclospora cayetanensis	<DL		(<1.00)	x10^5 org/g
Enterocytozoon species	<DL		(<1.00)	x10^5 org/g

HELMINTHS

TEST	RESULT
Ancylostoma species Hookworm	Not Detected
Ascaris species, Roundworm	DETECTED
Enterobius vermicularis, Pinworm	Not Detected
Hymenolepis spp, Tapeworm	Not Detected
Necator americanus, Hookworm	Not Detected
Strongyloides spp, Roundworm	Not Detected
Taenia species, Tapeworm	Not Detected
Trichuris trichiura, Whipworm	Not Detected

VIRUSES

TEST	RESULT
Adenovirus 40/41	Not Detected
Astrovirus (hAstro)	Not Detected
Norovirus GI/II	Not Detected
Rotavirus A	DETECTED
Sapovirus (I,II,IV,V)	Not Detected

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BACTERIAL PATHOGENS

TEST	RESULT	H/L	REFERENCE	UNITS
Aeromonas species	<DL		(<1.00)	x10^3 CFU/g
Campylobacter species	1.08	HH	(<1.00)	x10^5 CFU/g
C. difficile, Toxin A	<DL		(<1.00)	x10^4 CFU/g
C. difficile, Toxin B	<DL		(<1.00)	x10^4 CFU/g
Clostridium difficile, Hypervirulent	<DL		(<1.00)	x10^3 CFU/g
Enteroaggregative E. coli	<DL		(<1.00)	x10^3 CFU/g
Enteropathogenic E. coli	<DL		(<1.00)	x10^3 CFU/g
E. coli O157	<DL		(<1.00)	x10^2 CFU/g
Enteroinvasive E. coli/Shigella	<DL		(<1.00)	x10^3 CFU/g
Enterotoxigenic E. coli LT/ST	<DL		(<1.00)	x10^5 CFU/g
Salmonella species	<DL		(<1.00)	x10^5 CFU/g
Shiga toxigenic E. coli (stx1/2)	<DL		(<1.00)	x10^3 CFU/g
Vibrio species	<DL		(<1.00)	x10^4 CFU/g
Yersinia species	<DL		(<1.00)	x10^5 CFU/g
Helicobacter pylori	15.00	H	(<1.00)	x10^3 CFU/g

HELICOBACTER PYLORI PROFILE

TEST	RESULT
H. pylori Antigen	Negative

H. pylori Virulence Factors

TEST	RESULT
Virulence Factor, babA	DETECTED
Virulence Factor,oipA	Not Detected
Virulence Factor, virB	Not Detected
Virulence Factor, cagA	Not Detected
Virulence Factor, vacA	Not Detected
Virulence Factor, virD	Not Detected

H. pylori Resistance Genes

TEST	RESULT
Resistance gene A2142C	DETECTED
Resistance gene A2142G	Not Detected
Resistance gene A2143G	Not Detected

Actinobacteria Phylum Bacteroidetes Phylum Euryarchaeota Phylum Firmicutes Phylum Proteobacteria Phylum Verrucomicrobia Phylum

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OPPORTUNISTIC BACTERIA

TEST	RESULT	H/L	REFERENCE	UNITS
Bacillus species	<DL		(<1.00)	x10^4 CFU/g
Bacteroides fragilis	<DL		(<250.00)	x10^5 CFU/g
Bacteroides thetaiotaomicron	<DL		(<300.00)	x10^5 CFU/g
Phocaeicola vulgatus	<DL		(<300.00)	x10^5 CFU/g
Enterobacter cloacae complex	<DL		(<5.00)	x10^5 CFU/g
Enterococcus faecalis	<DL		(<1.00)	x10^5 CFU/g
Enterococcus faecium	<DL		(<1.00)	x10^5 CFU/g
Morganella species	<DL		(<1.00)	x10^5 CFU/g
Pseudomonas species	<DL		(<1.00)	x10^4 CFU/g
Pseudomonas aeruginosa	11.34	H	(<3.00)	x10^4 CFU/g
Staphylococcus species	<DL		(<1.00)	x10^3 CFU/g
Staphylococcus aureus	<DL		(<5.00)	x10^3 CFU/g
Streptococcus agalactiae	2.60		(<3.00)	x10^4 CFU/g
Streptococcus anginosus	<DL		(<1.00)	x10^6 CFU/g
Streptococcus mutans	<DL		(<1.00)	x10^4 CFU/g
Streptococcus oralis	<DL		(<1.00)	x10^6 CFU/g
Streptococcus salivarius	<DL		(<5.00)	x10^6 CFU/g

HYDROGEN UTILISING MICROBES

TEST	RESULT	H/L	REFERENCE	UNITS
Desulfovibrio piger	396.00	H	(<18.00)	x10^6 CFU/g
Methanobrevibacter smithii	5.54	H	(<1.00)	x10^5 CFU/g

POTENTIAL AUTOIMMUNE TRIGGERS

TEST	RESULT	H/L	REFERENCE	UNITS
Citrobacter species	<DL		(<5.00)	x10^4 CFU/g
Citrobacter freundii complex	0.55		(<5.00)	x10^4 CFU/g
Klebsiella species	1.37		(<5.00)	x10^3 CFU/g
Klebsiella pneumoniae complex	11.00	H	(<5.00)	x10^5 CFU/g
Prevotella copri	<DL		(<1.00)	x10^9 CFU/g
Proteus species	<DL		(<5.00)	x10^5 CFU/g
Proteus mirabilis	<DL		(<5.00)	x10^4 CFU/g
Fusobacterium species	42.42	H	(<20.00)	x10^4 CFU/g

Actinobacteria Phylum · Bacteroidetes Phylum · Euryarchaeota Phylum · Firmicutes Phylum · Proteobacteria Phylum · Verrucomicrobia Phylum

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MYCOLOGY

TEST	RESULT	H/L	REFERENCE	UNITS
Candida albicans	6.00	H	(<1.00)	x10^5 CFU/g
Candida dubliniensis	<DL		(<1.00)	x10^5 CFU/g
Candida famata	<DL		(<1.00)	x10^5 CFU/g
Candida glabrata	<DL		(<1.00)	x10^5 CFU/g
Candida guilliermondii	<DL		(<1.00)	x10^5 CFU/g
Candida intermedia	<DL		(<1.00)	x10^5 CFU/g
Candida kefyr	<DL		(<1.00)	x10^5 CFU/g
Candida krusei	<DL		(<1.00)	x10^5 CFU/g
Candida lambica	<DL		(<1.00)	x10^5 CFU/g
Candida lipolytica	<DL		(<1.00)	x10^5 CFU/g
Candida lusitaniae	<DL		(<1.00)	x10^5 CFU/g
Candida parapsilosis	2.20	H	(<1.00)	x10^5 CFU/g
Candida tropicalis	<DL		(<1.00)	x10^5 CFU/g
Candida species	<DL		(<1.00)	x10^5 CFU/g
Geotrichum species	<DL		(<1.00)	x10^5 CFU/g
Rhodotorula species	<DL		(<1.00)	x10^5 CFU/g
Saccharomyces cerevisiae	<DL		(<1.00)	x10^5 CFU/g

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NORMAL BACTERIAL GUT FLORA

TEST	RESULT	H/L	REFERENCE	UNITS
Akkermansia muciniphila	118.00	H	(1.00-50.00)	x10^7 CFU/g
TOTAL BIFIDOBACTERIA	21.00		(<2000.00)	x10^6 CFU/g
Bifidobacterium adolescentis	3.00		(<1000.00)	x10^6 CFU/g
Bifidobacterium bifidum	9.00		(<1000.00)	x10^6 CFU/g
Bifidobacterium breve	4.00		(<1000.00)	x10^6 CFU/g
Bifidobacterium longum	5.00		(<1000.00)	x10^6 CFU/g
Clostridium species	120.00	H	(5.00-50.00)	x10^7 CFU/g
Enterococcus species	56.50		(<2000.00)	x10^3 CFU/g
Escherichia species	5385.00	H	(3.70-3800.00)	x10^4 CFU/g
Faecalibacterium prausnitzii	890.00		(100.00-3500.00)	x10^6 CFU/g
TOTAL LACTOBACILLI	11.00		(<3000.00)	x10^3 CFU/g
Lactobacillus acidophilus	4.00		(<500.00)	x10^3 CFU/g
Lactobacillus casei	<DL		(<500.00)	x10^3 CFU/g
Lactobacillus delbrueckii	<DL		(<500.00)	x10^3 CFU/g
Lactobacillus plantarum	<DL		(<500.00)	x10^3 CFU/g
Lactobacillus rhamnosus	7.00		(<500.00)	x10^3 CFU/g
Lactobacillus salivarius	<DL		(<500.00)	x10^3 CFU/g
Oxalobacter formigenes	5.69		(<50.00)	x10^6 CFU/g

Actinobacteria Phylum Bacteroidetes Phylum Euryarchaeota Phylum Firmicutes Phylum Proteobacteria Phylum Verrucomicrobia Phylum

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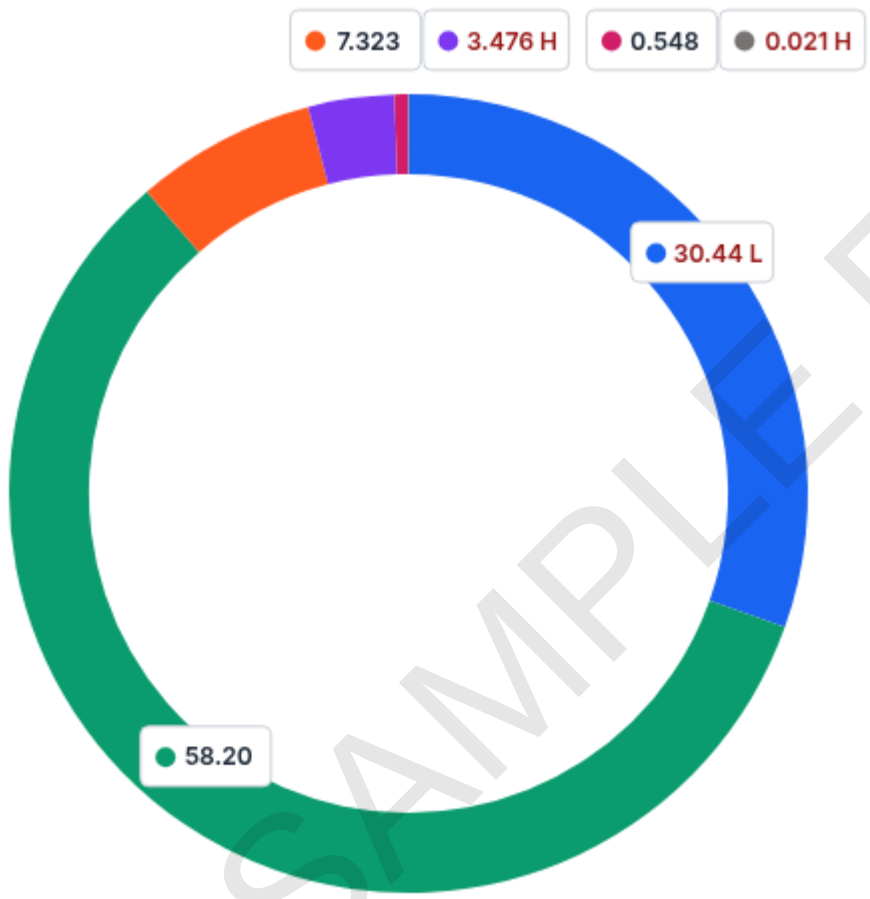
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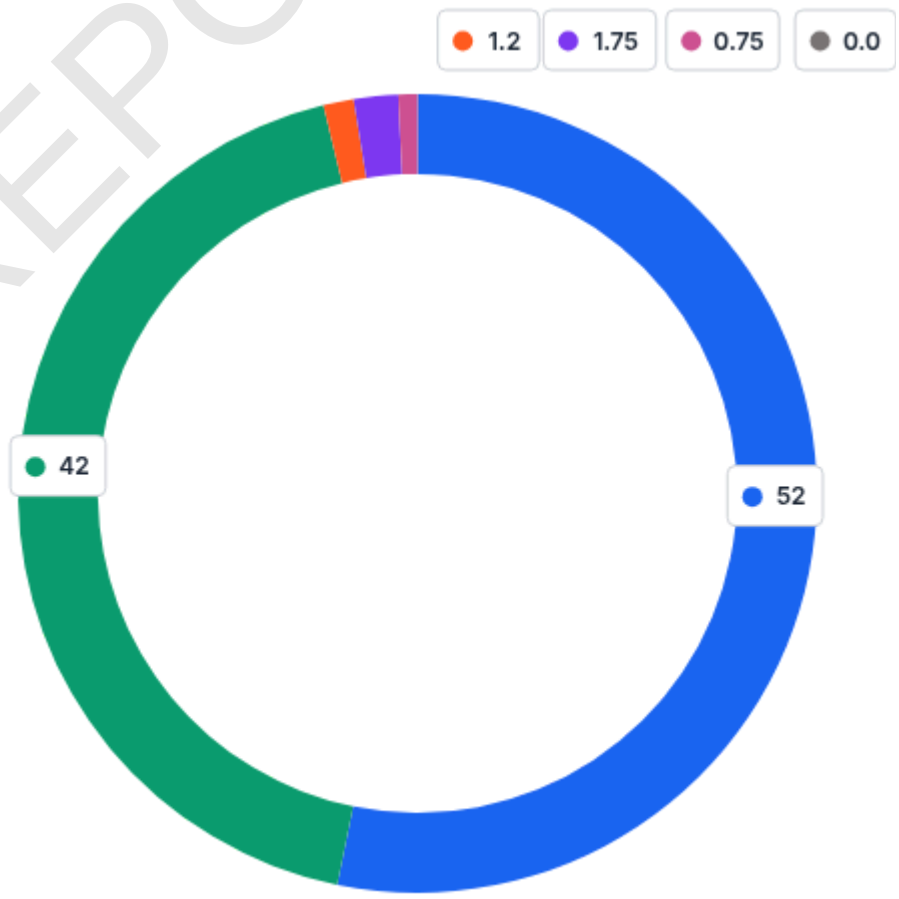
COMMENSAL RELATIVE ABUNDANCE

TEST	RESULT	H/L	REFERENCE	UNITS
Actinobacteria Phylum	0.548		(0.001-1.500)	%
Bacteroidetes Phylum	30.44	L	(40.00-87.00)	%
Euryarchaeota Phylum	0.021	H	(0.000-0.010)	%
Firmicutes Phylum	58.20		(10.00-60.00)	%
Proteobacteria Phylum	7.323		(0.250-5.000)	%
Verrucomicrobia Phylum	3.476	H	(0.000-2.400)	%

Your Phyla



Healthy Phyla



MICROBIOTA RATIO

TEST	RESULT	H/L	REFERENCE	UNITS
Firmicutes/Bacteroidetes Ratio	1.91	H	(<2.00)	ratio

Actinobacteria Phylum Bacteroidetes Phylum Euryarchaeota Phylum Firmicutes Phylum Proteobacteria Phylum Verrucomicrobia Phylum

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BACTERIAL CULTURE

Organism	Growth	H/L	Ref Range	Classification
Citrobacter freundii complex	3+		(<4+)	Non-Pathogen
Klebsiella pneumoniae complex	4+	H	(<4+)	Possible Pathogen
Klebsiella species	1+		(<4+)	Non-Pathogen
Pseudomonas aeruginosa	4+	H	(<4+)	Possible Pathogen

SUSCEPTIBILITY - BACTERIA

Antimicrobials	Citrobacter freundii complex	Klebsiella pneumoniae complex	Pseudomonas aeruginosa
	Susceptible	Susceptible	Susceptible
Ampicillin	R	S	NT
Augmentin	S	R	NT
Ciprofloxacin	S	S	S
Gentamicin	S	S	NT
Meropenem	S	S	S
Norfloxacin	S	S	NT
Trimethoprim/Sulpha	S	S	NT

R Resistant S Susceptible I Intermediate NT Not Tested

Disclaimer: The antibiotics listed have been reported as requested by the treating healthcare practitioner. Clinical necessity for antibiotic use may vary, and prescription should be based on the professional judgment of the healthcare practitioner and patient case. Information regarding natural inhibitors is provided for reference purposes only and is not intended to replace medical advice or treatment.

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NATURAL INHIBITORS - BACTERIA

Citrobacter freundii complex	Low Inhibition	High Inhibition
Berberine		
Black Walnut		
Caprylic Acid		
Citrus Seed (GSE)		
Coptis		
Garlic		
Golden Seal		
Oregano		

Klebsiella pneumoniae complex	Low Inhibition	High Inhibition
Berberine		
Black Walnut		
Caprylic Acid		
Citrus Seed (GSE)		
Coptis		
Garlic		
Golden Seal		
Oregano		

Klebsiella species	Low Inhibition	High Inhibition
Berberine		
Black Walnut		
Caprylic Acid		
Citrus Seed (GSE)		
Coptis		
Garlic		
Golden Seal		
Oregano		

NATURAL INHIBITORS - BACTERIA

Pseudomonas aeruginosa	Low Inhibition	High Inhibition
Berberine		
Black Walnut		
Caprylic Acid		
Citrus Seed (GSE)		
Coptis		
Garlic		
Golden Seal		
Oregano		

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MYCOLOGY CULTURE

Organism	Growth	H/L	Ref Range	Classification
Candida albicans	2+	H	(<2+)	Possible Pathogen
Candida parapsilosis	1+		(<2+)	Non-Pathogen
Geotrichum species	NEG		(<4+)	No Growth

SUSCEPTIBILITY - MYCOLOGY

Antimicrobials	Candida albicans Susceptible
Fluconazole	S
Voriconazole	S

R Resistant S Susceptible I Intermediate NT Not Tested

NATURAL INHIBITORS - MYCOLOGY

Candida albicans	Low Inhibition	High Inhibition
Nystatin		
Berberine		
Black Walnut		
Caprylic Acid		
Citrus Seed (GSE)		
Coptis		
Garlic		
Golden Seal		
Oregano		

NATURAL INHIBITORS - MYCOLOGY

Candida parapsilosis	Low Inhibition	High Inhibition
Nystatin		
Berberine		
Black Walnut		
Caprylic Acid		
Citrus Seed (GSE)		
Coptis		
Garlic		
Golden Seal		
Oregano		

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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 lactose, lactobacillus acidophilus, lactobacillus plantarum, lactobacillus casei, bifidobacterium breve, bifidobacterium bifidum, bifidobacterium longum, lactobacillus salivarius sup 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

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Macroscopy Comment

UNFORMED STOOL:

An UNFORMED stool specimen classified as Type 5 or 6 on the Bristol Stool Chart suggests rapid colonic transit, leading to inadequate water reabsorption and a looser stool consistency. This may result from mild digestive disturbances, dietary changes (such as high fibre or fat intake), stress, or gut microbiota imbalances (dysbiosis). Type 6, in particular, may indicate early-stage diarrhea, commonly linked to irritable bowel syndrome with Diarrhea (IBS-D), food intolerances (e.g., lactose, gluten, FODMAPs), gastrointestinal infections, or inflammatory responses. Clinical recommendations include identifying dietary triggers, ensuring adequate but not excessive fibre intake, and considering probiotic therapy (especially strains like Lactobacillus and Bifidobacterium) to help restore microbial balance. Persistent symptoms may warrant further evaluation for malabsorption syndromes (e.g., celiac disease, pancreatic insufficiency), small intestinal bacterial overgrowth (SIBO), or inflammatory markers to assess for underlying pathology.

MUCOUS HAS BEEN DETECTED IN THIS SPECIMEN:

The presence of mucous in the stool may be due to prolonged irritation of the intestinal mucosa. An increase of visible mucous may also be reflective of an inflammatory gastrointestinal condition such as: Crohns, Ulcerative colitis, irritable bowel syndrome (IBS) and infection.
Treatment:

- Investigate and treat possible underlying cause.
- Assess other Gut markers (e.g. calprotectin, M2PK, etc).

FAECAL OCCULT BLOOD POSITIVE:

Faecal occult blood has been detected in this specimen. The presence of blood in the stool may be the result of several causes besides colorectal bleeding, including hemorrhoids or gastrointestinal infection. Results should be considered with other clinical information available to the physician. Please note: A positive result indicates that the sample likely contains a human haemoglobin concentration >20ng/ml (Limit of detection). Review this result with other inflammation markers such as calprotectin.

Short Chain Fatty Acids Comment

LOW BENEFICIAL SCFAs:

Low Short chain Fatty Acid, Beneficial levels may be indicated by reduced beneficial flora such as Lactobacillus, Bifidobacterium, Escherichia and other normal bacterial gut flora levels. Suspect increased susceptibility to pathogenic bacterial infection, increased toxic enzyme exposure, increased risk for mucosal barrier defects and immune dysregulation.

GIT Markers Comment

PANCREATIC ELASTASE NORMAL (>200 ug/g):

A faecal pancreatic elastase level >200 ug/g indicates normal exocrine pancreatic function.

beta GLUCURONIDASE ELEVATED:

Beta-glucuronidase is a bacterial enzyme that may limit the body's ability to excrete compounds such as drugs, hormones, and environmental toxins. Certain bacteria may also increase Beta-glucuronidase such as elevated levels of E.coli.

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. Additionally, one human study has suggested that consuming glucomannan can reduce fecal beta-glucuronidase activity. Glucomannan is a type of prebiotic fiber found in konjac root which is commonly used to make low calorie pasta and noodles.

ACCREDITATION SCOPE: Please note that the above test is currently not under the laboratory's scope of accreditation.

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CALPROTECTIN BORDERLINE (51-100 ug/g):

A borderline faecal calprotectin level (51–100 ug/g) may reflect mild inflammation or a non-specific increase and is not diagnostic of IBD.

Borderline elevations may be seen in a range of conditions including early or quiescent IBD, gastrointestinal infections, colorectal neoplasia, or as a pharmacological effect of medications such as NSAIDs, aspirin, and proton pump inhibitors (PPIs).

Repeat testing in 4–6 weeks is recommended if clinical suspicion of IBD remains or if symptoms persist. Correlation with history, medication use, and other diagnostic investigations (e.g., colonoscopy, imaging) is essential.

This result may warrant further monitoring.

FAECAL TRANSGLUTAMINASE IgA: POSITIVE

Tissue Transglutaminase is the most specific test for Coeliac Disease. Levels greater than 100 are deemed as POSITIVE.

Treatment:

Avoid gluten containing foods. Also assess IgG/IgA Food sensitivity tests to identify specific food intolerances.

ACCREDITATION SCOPE: Please note that the above test is currently not under the laboratory's scope of accreditation.

SECRETORY IGA LOW:

Secretory IgA is the predominant immunoglobulin in mucosal secretions, including the gastrointestinal tract, where it plays a critical role in maintaining mucosal immunity by neutralising pathogens and preventing microbial adhesion to the intestinal epithelium. Low levels of secretory IgA in stool may indicate impaired mucosal immune function or compromised gut barrier integrity. This reduction can result from chronic stress, malnutrition, immunodeficiency, certain infections, or prolonged use of immunosuppressive medications.

Clinically, low sIgA may predispose individuals to increased susceptibility to gastrointestinal infections, dysbiosis, and inflammation. It can also reflect a weakened first line of defense in the gut-associated lymphoid tissue, potentially contributing to increased antigen exposure and systemic immune activation.

ACCREDITATION SCOPE: Please note that the above test is currently not under the laboratory's scope of accreditation.

ELEVATED ZONULIN:

Zonulin is a regulatory protein that modulates the permeability of the intestinal barrier by controlling the opening and closing of tight junctions between intestinal epithelial cells. While physiologically important for nutrient and fluid absorption, excessive zonulin release can lead to increased intestinal permeability, often referred to as “leaky gut.” This condition may contribute to systemic inflammation, liver stress, nutrient malabsorption, and has been associated with autoimmune diseases such as rheumatoid arthritis.

Elevated zonulin levels may indicate disruption of gut barrier integrity and should be interpreted alongside other inflammatory markers, such as faecal calprotectin, to assess intestinal inflammation. Potential triggers for increased zonulin release include imbalances in gut microbiota and exposure to dietary factors like gluten or gliadin.

ACCREDITATION SCOPE: Please note that the above test is currently not under the laboratory's scope of accreditation.

ELEVATED STEATOCRIT:

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

Treatment:

o Prebiotic and probiotic supplementation

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o Supplement hydrochloride, digestive enzymes or other digestive aids

o Investigate underlying causes

o Investigate food sensitivities and allergies

o Remove potential irritants

o Review markers such as pancreatic elastase 1 and calprotectin

pH LOW:

A lower-than-normal stool pH suggests increased fermentation of carbohydrates, often due to gut dysbiosis, excessive short-chain fatty acid (SCFA) production, or malabsorption of sugars. This is commonly seen in lactose intolerance, SIBO, high-fibre diets, or imbalanced gut flora. Excessive acidity may contribute to gut irritation and barrier dysfunction.

Parasites/Worms Comment

ELEVATED BLASTOCYSTIS HOMINIS LEVEL:

Blastocystis hominis may be the cause of persistent, mild diarrhoea. Although considered endemic, it may also be associated with recent overseas travel. Detection suggests the ingestion of contaminated material or contact with farm animals. Continued symptoms may require further testing for the detection of bacterial, viral and/or parasitic co-pathogens.

TREATMENT SUGGESTIONS: Mild symptoms are self-limiting. If treatment is warranted, metronidazole 400 - 750mg (child 12-17mg/kg up to 750mg) three times daily for at least 10 days. Lower dosages are usually associated with treatment failure. Paromomycin has also shown to be effective as an alternative treatment option. Rule out allergy to above medication before prescribing/taking. Consult ID specialist if patient is showing severe symptoms or immunocompromised.

ELEVATED GIARDIA LEVEL:

Giardia intestinalis is a protozoan parasite occurring worldwide, especially common in areas with poor sanitary conditions and insufficient water. Clinical presentation ranges from asymptomatic carriage to acute and chronic giardiasis (including sudden onset of diarrhoea, malaise, steatorrhea, abdominal cramps, bloating, flatulence, nausea, weight loss, vomiting and fever). Treatment of patients with asymptomatic passage of giardia is not necessary.

TREATMENT SUGGESTIONS: For symptomatic patients, treatments include; Tinidazole (child: 50mg/kg up to) 2g orally, as one dose. or Metronidazole (child: 30mg/kg up to) 2g orally, daily for 3 days. or If the above treatment fails, a longer course of metronidazole is sometimes required. Metronidazole (child: 10mg/kg up to) 400mg orally, 8-hourly for 7 days. Rule out allergy to above medication before prescribing/taking. Consult ID specialist if patient is showing severe symptoms or immunocompromised.

PLEASE NOTE: Giardia detection has been confirmed through a secondary PCR test. Giardia is a Notifiable Disease in ACT, WA, TAS and NSW. If Applicable: This result has been notified to the Department of Health.

NOTIFICATION BY THE REFERRING PRACTITIONER may also be required under the Public Health and Wellbeing Act 2009.

ASCARIS SPECIES (Roundworm) DETECTED:

Ascaris species (including A. lumbricoides and A. suum) are the most common parasitic roundworm in humans. Hosts may be asymptomatic, causing only malnutrition and growth retardation or present with severe gastrointestinal (abdominal pain, nausea, vomiting, bloating or diarrhoea) or lung symptoms (fever, cough or wheezing). Adult worms can also migrate causing cholecystitis, cholangitis, pancreatitis, small bowel obstruction or appendicitis. Infection occurs via ingestion of eggs, usually found in stool-contaminated soil.

TREATMENT SUGGESTIONS:

Effective treatments include Albendazole or Mebendazole single oral dose. Rule out allergy to above medication before prescribing/taking. Can repeat dose after 4-6 weeks. Whole family to be treated simultaneously. Hand hygiene and washing bedding /clothes in hot water cycle is recommended to prevent recurrence. A repeat test should be suggested post therapy.

Viral Pathogens Comment

ROTAVIRUS DETECTED:

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DESCRIPTION: Rotavirus is a very contagious viral illness and transmission is via the faecal-oral route, usually through direct contact between people. Common cause of childhood diarrhoea eosinophilic gastroenteritis. neonates and infants, Childcare outbreaks are common. Symptoms include foul smelling green watery stools (diarrhoea), abdominal pain, low-grade fever, irritable and dehydration. Short-lived, lasting about 24-72 hours. A repeat test for Enteric Viral Pathogens should be requested to ensure that the virus has cleared.

TREATMENT SUGGESTIONS:

Conservative hygiene measures such as handwashing, Hydration and strict isolation is recommended for cases as such.

PLEASE NOTE: Rotavirus detection has been confirmed through a secondary PCR test. Rotavirus is a Notifiable Disease. This result has been notified to the Department of Health.

NOTIFICATION BY THE REFERRING PRACTITIONER may also be required under the Public Health and Wellbeing Act 2009.

Opportunistic Bacteria Comment

PSEUDOMONAS AERUGINOSA ELEVATED: PHYLUM: Proteobacteria

DESCRIPTION: Pseudomonas aeruginosa is a gram-negative, aerobic, non-spore forming bacteria that can cause a variety of infections in both immunocompetent and immunocompromised hosts. It is commonly found in the environment, particularly in freshwater, hot tubs, and swimming pools. Chronic gastrointestinal colonization is acknowledged to be an important component of P. aeruginosa diarrheal disease and systemic infections. Since disruption of the normal flora by antibiotics can reduce colonization resistance and promote pathologic colonization with P. aeruginosa, enterocolitis due to P. aeruginosa may also be considered to be an antibiotic-associated gastroenteritis. Pseudomonas aeruginosa in the gastrointestinal tract can cause inflammation, epithelial barrier dysfunction, tight cell junction interruption, and intestinal permeability.

TREATMENT SUGGESTIONS: If treatment is warranted, Pseudomonas is usually susceptible to antipseudomonal penicillins, aminoglycosides, carbapenems, 3rd generation cephalosporins and gentamycin. Plant-derived anti-biofilm products identified against P. aeruginosa include alkaloids, organosulfur compounds, flavonoids, phenolic compounds and terpenoids. Rule out allergy to above medication before prescribing/taking.

STREPTOCOCCUS AGALACTIAE (GROUP B) ELEVATED: PHYLUM: Firmicutes

DESCRIPTION: S. agalactiae, a Gram-positive coccus found in the gut microbiome, is a significant pathogen causing invasive infections in adults, particularly the elderly and those with underlying health conditions.

TREATMENT SUGGESTIONS: Consuming probiotics, such as Lactobacillus and Bifidobacterium species, can help maintain a healthy balance in the gut microbiome and inhibit the overgrowth of S. agalactiae. Fermented foods such as yogurt, kefir, sauerkraut, and kimchi have also shown to be beneficial. Guided antibiotic therapy may be considered.

METHANOBREVIBACTER SMITHII ELEVATED: PHYLUM: Euryarchaeota

DESCRIPTION: Methanobrevibacter smithii is a methane-producing microbe that plays an important role in the gut ecosystem by facilitating carbohydrate fermentation and production of short-chain fatty acids by commensal bacteria. Elevated levels may be associated with abdominal bloating, constipation, flatulence, inflammatory bowel disease (IBD), irritable bowel syndrome (IBS), colorectal cancer, diverticulosis or obesity and often correlate with a positive SIBO test. Methanobrevibacter smithii has also been closely correlated with the presence of Blastocystis hominis.

TREATMENT SUGGESTIONS: Elimination of methanogenic flora using antibiotic treatment may contribute to therapeutic benefits and include neomycin or rifaximin. Antimicrobial herbs may also be beneficial in treatment (including garlic and oregano). Rule out allergy to above medication before prescribing/taking.

DESULFOVIBRIO PIGER ELEVATED: PHYLUM: Proteobacterium

DESCRIPTION: Desulfovibrio piger is part of a group called sulfate-reducing bacteria (SRB) and are normal inhabitants of the intestine. Sulfate is present in different concentrations in the intestine dependent on diet. Remnants not absorbed, alongside the presence of lactate, promote the growth of SRB. Desulfovibrio Piger has been implicated in gastrointestinal disorders such as ulcerative colitis via the reduction of sulfate to hydrogen sulfide in the gut. High Delsulfovibrio piger levels may be associated with diarrhea or inflammatory bowel disease.

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TREATMENT SUGGESTIONS: Treatment options include lowering the intake of sulfate rich foods such as some breads, dried fruits, beers, ciders and wines. It is also suggested to avoid foods high in fat.

Potential Autoimmune Trigger Comment

FUSOBACTERIUM SPECIES ELEVATED: PHYLUM: Fusobacteriota

DESCRIPTION: Fusobacterium species are gram-negative bacteria and are common members of the human oral and faecal microbiome. It has been demonstrated to promote the release of intestinal inflammatory factors and disrupt the intestinal barrier function. As such F. nucleatum elevation may contribute to the etiology of some gastrointestinal disorders, such as appendicitis, colon cancer, and inflammatory bowel disease (IBD). It may also induce an increase in secretory IgA and a decrease in beneficial bacteria levels such as Lactobacillus. Review this level with faecal calprotectin.

TREATMENT SUGGESTIONS: If treatment is warranted, effective antibiotics may include metronidazole or erythromycin. The use of herbal antimicrobials (Tea polyphenols- green and black tea extracts and peppermint) and probiotic treatment may also be effective. Rule out allergy to above medication before prescribing/taking.

KLEBSIELLA PNEUMONIAE COMPLEX ELEVATED: PHYLUM: Proteobacteria

DESCRIPTION:

Klebsiella pneumoniae is a gram-negative, encapsulated, non-motile bacterium found in the environment and typically colonizes human mucosal surfaces of the oropharynx and gastrointestinal tract. Increased colonisation causes insult to the intestinal mucosa via the secretion of toxins and subsequent inflammatory response that may lead to inflammation-related gastrointestinal diseases. It Is typically associated with diseases related to upper respiratory tract infection; however, elevated levels may be associated with gastrointestinal diseases such as Irritable bowel disease, Crohn's and ulcerative colitis.

TREATMENT SUGGESTIONS:

Treating K. pneumoniae infections is difficult due to the increased emergence in resistant strains and if treatment is warranted, a combination of antibiotics may be used. Klebsiella appears to thrive in individuals on a high starch diet. Avoiding carbohydrates such as rice, potatoes, flour products and sugary foods may reduce the amount of Klebsiella in the gut. The use of herbal antimicrobials oregano (Origanum vulgare), sage (Salvia officinalis) or thyme (Thymus vulgaris) may also be effective.

Bacterial Pathogens Comment

CAMPYLOBACTER SPECIES ELEVATED: PHYLUM: Proteobacteria

DESCRIPTION: Campylobacter species are a common cause of acute self-limiting diarrhoea. Antibiotic therapy is recommended in severe or prolonged cases or high-risk patients, like: Food handlers/Health-care workers/Child-care workers/Pregnancy/Immunocompromised. Poultry is a key source of infection, in particular chicken. Red meat and shellfish can also harbor the organism. Other sources include unpasteurized milk, and water contaminated by wild birds. Symptoms can include fever, abdominal cramping, diarrhea (often bloody) abdominal pain and fever. Relapses may occur in 5%-10% of untreated cases.

TREATMENT SUGGESTIONS: Mild cases can be self-limiting. For severe/high risk patients, treatments include: Azithromycin 500mg orally, daily for 3 days. (Child: 10 mg/kg up to 500mg) Or Ciprofloxacin 500mg orally, 12 hourly for 3 days. (Child: 12.5 mg/kg up to 500mg) Or Rule out allergy to above medication before prescribing/taking. Consult ID specialist if patient is showing severe symptoms or immunocompromised.

PLEASE NOTE: Detection has been confirmed through a secondary PCR test. Campylobacter is a Notifiable Disease. This result has been notified to the Department of Health.

NOTIFICATION BY THE REFERRING PRACTITIONER may also be required under the Public Health and Wellbeing Act 2009.

HELICOBACTER PYLORI ELEVATED: PHYLUM: Proteobacteria

DESCRIPTION: Helicobacter pylori is a gram-negative bacterium found on the luminal surface of the gastric epithelium. An elevated result indicates a current infection and is not affected by the presence of other organisms, antacids, barium sulphate, blood or fat. Please

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correlate infection clinically with signs and symptoms.

TREATMENT: Triple therapy: PPI, clarithromycin and amoxicillin or metronidazole, 7-14 days. If penicillin allergic: PPI, clarithromycin and clindamycin or metronidazole, 7-14 days. If the patient is asymptomatic consider other alternative therapies including:

o Black currant seed oil and fish oil

o Lactobacillus Probiotics

o Vitamin C

o Mastic gum.

H. Pylori Virulence Factor,babA DETECTED:

Blood Group Antigen Binding Adhesion (BabA) promotes DNA breakage in host cell, Improves H. pylori adherence ("stickiness") to epithelial cells and can promote other virulence factors, especially CagA.

Treatment: More aggressive treatment may be warranted; consider the use of adhesion inhibitions.

Mycology Comment

CANDIDA ALBICANS ELEVATED: PHYLUM: Ascomycota

DESCRIPTION: Candida albicans is a genus of yeasts found in the environment and present in healthy persons colonizing the oropharyngeal, oesophageal, and gastrointestinal mucosa. Considered an opportunistic pathogen, C. albicans can cause superficial but also more severe systemic infections. Candidiasis is an opportunistic infection due to Candida, which can affect the oral cavity, vagina, penis, or gastrointestinal tract. Elevated Candida gastrointestinal colonization is associated with several diseases including Crohn's and inflammatory bowel disease as well as with antibiotic usage. Other common symptoms include: Gas, bloating, constipation, nausea and skin conditions such as Eczema.

TREATMENT SUGGESTIONS: Dietary: Reduce intake of sugars, starches, and fungi. Candida infections may be treated if warranted with antifungal medications such as nystatin, clotrimazole, amphotericin B or miconazole. Probiotic Lactobacillus treatment may also be effective. Rule out allergy to above medication before prescribing/taking.

CANDIDA PARAPSILOSIS ELEVATED:

Candida parapsilosis is a yeast species that is part of the normal human microbiota but can become opportunistic under certain conditions. Overgrowth of C. parapsilosis in the gut can disrupt the microbial balance and lead to symptoms such as bloating, gas, and diarrhea. In immunocompromised individuals, C. parapsilosis is a potential pathogen and has been linked to invasive infections, though gastrointestinal symptoms are more common in cases of mild dysbiosis. When elevated guided susceptibility testing should be considered.

Normal Bacterial Flora Comment

BIFIDOBACTERIUM ADOLESCENTIS LOW: PHYLUM: Actinobacteria

DESCRIPTION: Bifidobacterium adolescentis is an anaerobic species of bacteria found in the gastrointestinal tracts of humans. It is one of the most abundant and prevalent Bifidobacterium species commonly found in adults. It contributes to the production of GABA, a neurotransmitter that plays a role in reducing stress and anxiety. Some strains can synthesise B vitamins, such as folic acid. B. adolescentis enhances the growth of all bifidobacteria.

TREATMENT SUGGESTIONS: Consider a probiotic supplement containing B. adolescentis and consuming prebiotic-rich foods like garlic, onions, and whole grains. Increase dietary fibre from fruits, vegetables, and legumes, and incorporate fermented foods such as yogurt and kefir.

BIFIDOBACTERIUM BREVE LOW: PHYLUM: Actinobacteria

DESCRIPTION: Bifidobacterium breve is a Gram-positive, anaerobic bacterium that is commonly found in the human gastrointestinal tract, particularly in the intestines of infants. B. breve is known for its ability to metabolise various carbohydrates, including human milk oligosaccharides, which is essential for the development of a healthy gut flora in newborns. Studies demonstrate that B. breve exhibits

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several beneficial properties, including the production of short-chain fatty acids (SCFAs) such as acetate, which contribute to gut health by lowering pH and inhibiting the growth of pathogenic bacteria. Additionally, B. breve may alleviate symptoms of irritable bowel syndrome (IBS) and improve symptoms of atopic dermatitis.

ESCHERICHIA SPECIES ELEVATED: PHYLUM: Proteobacteria

DESCRIPTION: Escherichia is a genus of Gram-negative, non-spore-forming, facultatively anaerobic, rod-shaped bacteria and normal inhabitants of the gastrointestinal tract. Species include E. albertii, E. fergusonii, E. hermannii, E. marmotae and most notably E. coli. High levels may be indicative of increased intestinal inflammatory activity and be associated with irritable bowel syndrome, Crohn's, ulcerative colitis and diarrhea. Studies have also revealed that chronic psychological stress may be associated with an increase in E.Coli colonisation.

TREATMENT SUGGESTIONS: Commensal probiotic cocktails are suggested to prevent and reverse gut elevated colonization.

LACTOBACILLUS CASEI LOW: PHYLUM: Firmicutes

DESCRIPTION: Lactobacillus casei is a Gram-positive, rod-shaped, non-spore-forming, anaerobic probiotic bacterium involved in the fermentation of foods like cheese and yogurt. It produces antimicrobial substances, enhances gut barrier function, reduces pathogenic bacteria, and modulates the immune system. This bacterium is used to prevent and may assist various forms of diarrhea, including infectious diarrhea, traveller's diarrhea, and antibiotic-associated diarrhea.

TREATMENT SUGGESTIONS: Consider probiotic supplementation containing L. casei and consuming fermented foods such as cheese and yogurt.

LACTOBACILLUS DELBRUECKII LOW: PHYLUM: Firmicutes

DESCRIPTION:

Lactobacillus delbrueckii is a beneficial Gram-positive bacterium commonly found in the gut microbiome and known for its role in maintaining gastrointestinal health. It produces lactic acid through the fermentation of carbohydrates, contributing to a lower gut pH, which inhibits the growth of pathogenic microorganisms such as Clostridium and Candida species. Additionally, L. delbrueckii can enhance the intestinal barrier function and modulate the host immune response by promoting the production of anti-inflammatory cytokines. Its presence in the gut is associated with improved digestion and nutrient absorption, making it an important component in supporting overall gut health and microbial balance.

LACTOBACILLUS PLANTARUM LOW: PHYLUM: Firmicutes

DESCRIPTION: Lactobacillus plantarum is a Gram-positive, non-spore-forming, rod-shaped bacterium. L. plantarum plays a crucial role in gut health by enhancing intestinal barrier function, modulating the immune system, and inhibiting pathogenic bacteria. Additionally, it is beneficial for conditions such as irritable bowel syndrome, ulcerative colitis, and high cholesterol.

TREATMENT SUGGESTIONS: Consider probiotic supplementation containing L. plantarum.

LACTOBACILLUS SALIVARIUS LOW: PHYLUM: Firmicutes

DESCRIPTION: Lactobacillus salivarius is a Gram-positive, rod-shaped, non-spore-forming bacterium predominantly found in the human oral cavity, gastrointestinal tract, and vagina. It plays a significant role in maintaining oral and gut health by producing lactic acid and bacteriocins, which inhibit the growth of pathogenic bacteria. L. salivarius enhances gut barrier function, modulates the immune system, and helps in the digestion of proteins and complex carbohydrates. It has been studied for its potential benefits in managing conditions such as irritable bowel syndrome (IBS), periodontal disease, and atopic dermatitis, highlighting its importance in promoting overall health and preventing infections.

TREATMENT SUGGESTIONS: Consider L. salivarius as a probiotic strain which may improve intestinal permeability and immune response.

CLOSTRIDIUM SPECIES ELEVATED: PHYLUM: Firmicutes

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DESCRIPTION: Clostridium is a genus of anaerobic, Gram-positive bacteria found in the environment and the intestinal tract. This genus includes several species and can utilize large amounts of nutrients that cannot be digested by host and produce short-chain fatty acids (SCFAs), which play a noticeable role in intestinal homeostasis. Colonisation of Clostridium species may be affected by diet (carbohydrate and protein in diet) and general health and may be protective against inflammation and infection. However, some species may act as potential pathogens. Elevated Clostridium species may indirectly damage the intestinal epithelial cells. Another symptom may include constipation.

TREATMENT SUGGESTIONS: Treatment may involve the use of probiotics, treatment of any intestinal infections and dietary modification (reduce consumption of different fibres, such as inulin, oligofructose, arabinoxylan, guar gum and starch).

AKKERMANSIA MUCINIPHILA ELEVATED: PHYLUM: Verrucomicrobia

DESCRIPTION: Akkermansia muciniphila is a Gram-negative, strictly anaerobic, non-motile bacterium, often considered a human intestinal symbiont. There is growing evidence to suggest that the prevalence of this bacteria is associated with intestinal homeostasis, immunity, and a healthy gut. However, elevated colonisation may be associated with intestinal inflammation.

TREATMENT SUGGESTIONS: Treatment may involve the use of probiotics, treatment of any intestinal infections and dietary modification.

Key Phyla Comment

EURYARCHAEOTA (PHYLUM) ELEVATED:

DESCRIPTION: Euryarchaeota are a phylum of a diverse range of bacteria, including methanogens, halophiles and sulfate-reducers. Three distinct species within the group of Euryarchaeota have been regularly detected within the human body. Among these is the primary colonizer of the human gut system Methanobrevibacter smithii and the less frequently found species Methanosphaera stadtmanae, while in the oral cavity M. oralis is the predominating methanogenic species. Methanogens support the growth of fermenting bacteria, which themselves could be either true pathogens or at least opportunistic pathogens but also members of the commensal flora. They may also transform heavy metals or metalloids into volatile methylated derivatives which are known to be more toxic than the original compounds. Elevated Euryarchaeota may be associated with inflammatory bowel disease, Crohn's, irritable bowel syndrome, colorectal cancer, diverticulosis, and obesity. It may also affect short chain fatty acid production and absorption.

TREATMENT SUGGESTIONS: If treatment is warranted, Statins may be used to inhibit methanogenic archaea growth without affecting bacterial numbers. Symptoms may also be treated with dietary modification (low FODMAP) and probiotics. A lactulose SIBO test may be considered to assess Methanogen levels.

VERRUCOMICROBIA (PHYLUM) ELEVATED:

DESCRIPTION: Verrucomicrobia is a phylum of Gram-negative bacteria that contains only a few described species, found in the environment and gastrointestinal tract. Akkermansia spp. is involved in gut membrane integrity and may be increased with polyphenols and prebiotics. Verrucomicrobia aid in glucose homeostasis of the human gut and have anti-inflammatory properties that further aid in intestinal health.

TREATMENT SUGGESTIONS: Probiotic use and dietary modification use may assist in the rebalancing of microbial flora.

FIRMICUTES/BACTEROIDETES RATIO ELEVATED:

Elevated Firmicutes/Bacteroidetes ratio is frequently cited in the scientific literature as a hallmark of obesity, metabolic syndrome, irritable bowel syndrome or diabetes risk. The ratio may also be used to evaluate commensal microbial balance. The calculation provided in this report is made by the sum of abundance of Firmicutes tested divided by the sum of abundance Bacteroidetes. Reference ranges are based off internal cohort studies.

TREATMENT SUGGESTIONS: Balance commensal bacteria using the 4R Protocol which is located at the end of this test report. When firmicutes are high, consider using Bifidobacterium probiotics and Saccharomyces boulardii primarily. Lactobacillus spp. and Bacillus spp. (found in probiotics) can elevate firmicutes. It is further suggested to optimize the patient diet. A lower fat diet may assist to normalize the F/B ratio.

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Microorganism Culture Comment

CAMPYLOBACTER SP. PRESENT:

Campylobacter species are a common cause of acute self-limiting diarrhoea. Antibiotic therapy is recommended in severe or prolonged cases. Therapy may also be indicated in late pregnancy, food handlers and child care assistants, since it may shorten duration of faecal carriage following resolution of symptoms. A reactive arthritis may follow this infection.

TREATMENT SUGGESTIONS:

For symptomatic patients, treatments include:

Azithromycin 500mg (child: 10 mg/kg up to 500mg) orally, daily for 3 days

or

Ciprofloxacin 500mg (child: 12.5 mg/kg up to 500mg) orally, 12 hourly for 3 days

or

Norfloxacin 400mg (child: 10mg/kg up to 400mg) orally, 12 hourly for 5 days

Rule out allergy to above medication before prescribing/taking. Consult ID specialist if patient is showing severe symptoms or immunocompromised.

PLEASE NOTE:

Campylobacter detection has been confirmed through a secondary PCR test.

Campylobacter is a Notifiable Disease. This result has been notified to the Department of Health.

NOTIFICATION BY THE REFERRING PRACTITIONER may also be required under the Public Health and Wellbeing Act 2009.

CITROBACTER FREUNDII COMPLEX consists of several species including C. freundii, C. braakii, C. gillenii, C. murliniae, C. sedlakii, C. werkmanii and C. youngae and are Gram-negative bacteria from the phylum Proteobacteria and is a common resident of the human gut microbiome. Typically found as a commensal organism, C. freundii plays a minor role in maintaining microbial diversity within the gut. However, it is also an opportunistic pathogen, particularly in immunocompromised individuals, and has been linked to infections such as urinary tract infections, pneumonia, and bacteremia (Whalen et al., 2007). In the context of gut health, C. freundii generally poses little risk, but during episodes of dysbiosis or antibiotic treatment, its population can increase, leading to potential infections. Its ability to acquire antibiotic resistance, especially through horizontal gene transfer, makes it a clinical concern when overgrowth occurs. Monitoring C. freundii in gut microbiome studies is essential for understanding its role in both health and disease.

KLEBSIELLA PNEUMONIAE COMPLEX consists of seven closely related species including the most frequently isolated K. pneumoniae, K. variicola and K. quasipneumoniae and are Gram-negative bacteria from the phylum Proteobacteria and is a common member of the human gut microbiome. While it generally exists as a commensal organism, it can become an opportunistic pathogen, particularly in immunocompromised individuals or during gut dysbiosis. K. pneumoniae is a significant cause of healthcare-associated infections, including pneumonia, urinary tract infections, septicemia, and liver abscesses (Podschun and Ullmann, 1998). In the gut, K. pneumoniae contributes to microbial diversity, but its overgrowth or translocation can lead to severe infections. It is particularly concerning due to its ability to develop antibiotic resistance, including carbapenem-resistant strains, making it a major clinical threat (Pitout et al., 2015). Monitoring K. pneumoniae in the gut microbiome is crucial for understanding its role in both health and infection risk.

PSEUDOMONAS AERUGINOSA, belonging to the phylum Proteobacteria, is a Gram-negative bacterium commonly known for its opportunistic pathogenicity. While it is primarily associated with infections in immunocompromised patients and chronic infections such as cystic fibrosis, its presence in the gut microbiome is less well-characterized. In the gut, P. aeruginosa can be part of the microbial community, often as a transient or minor member. Its potential impact on gut health includes interactions with other gut microbiota, which could influence inflammation and microbial balance (Pang et al., 2019). Despite its role as a pathogen, understanding its dynamics within the gut microbiome could offer insights into its broader ecological roles and impact on gastrointestinal health (Kresse et al., 2018).

CANDIDA PARAPSILOSIS is a yeast from the phylum Ascomycota and is a part of the human gut microbiome. Typically found in low abundance, it can act as a commensal organism but has the potential to become opportunistic, particularly in immunocompromised individuals or those undergoing gut dysbiosis (Tavanti et al., 2005). C. parapsilosis is often associated with invasive infections, such as

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fungemia, especially in hospital settings, where it can cause catheter-related bloodstream infections. In the gut microbiome, its role is generally minor, but its ability to form biofilms and resist certain antifungal agents makes it a concern when overgrowth occurs. Monitoring C. parapsilosis levels in the gut is important for understanding its potential contribution to infection, particularly in vulnerable populations.

Methodology

Automated Chemistry/Immunochemistry, Chemiluminescence Immunoassay (CLIA), Enzyme-Linked Immunosorbent Assay (ELISA), Microscopy, Fluorescence Enzyme Immunoassay (FEIA), pH Electrode, Gas Chromatography-MS (GC/MS), Quantitative PCR (qPCR), Polymerase Chain Reaction (PCR), MALDI-TOF (Matrix-Assisted Laser Desorption/Ionization Time of Flight)

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