

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	Formed	Formed	Form -A formed stool is considered normal. Variations to this may indicate abnormal GIT conditions.
Mucous	ND	< +	Mucous - Mucous production may indicate the presence of an infection, inflammation or malignancy.
Blood (Macro)	ND	< +	Blood (Macro) - 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.

MICROSCOPIC DESCRIPTION

	Result	Range	Markers
RBCs (Micro)	ND	< +	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	ND	< +	Fat Globules -The presence of fat globules may indicate fat maldigestion.
Starch	ND	< +	Starch - The presence of starch grains may indicate carbohydrate maldigestion.

Microscopy Comment

FOOD REMNANTS PRESENT: Consider hypochlorhydria, pancreatic insufficiency, inadequate chewing.
Treatment:

- Consider hydrochloride, digestive enzymes or other digestive aids
- Improve chewing
- Assess other CDSA markers such as pH, pancreatic elastase 1, H. pylori & other food fibres.

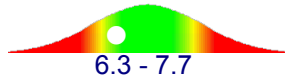
DIGESTIVE MARKERS

	Result	Range	Markers
Meat Fibres	ND	< +	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.

METABOLIC MARKERS

pH

6.4



Markers

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.

BENEFICIAL BACTERIA

	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 intestinal pH, 3) the reduction of cholesterol, 4) the synthesis of vitamins and disaccharidase enzymes.

OTHER BACTERIA

	Result	Range
Klebsiella	+++	< +++
Pseudomonas	ND	< +++
Campylobacter	ND	< +
Citrobacter	++++	< +++
Yersinia	ND	< +
Other Bacteria.	+++	< +++

COMMENTS:

YEASTS

	Result	Range
Candida albicans	ND	< +
Other Yeasts	++	< +

COMMENTS:

PARASITES

	Result	Range
Cryptosporidium	ND	< +
Giardia lamblia	ND	< +
Entamoeba Histolytica	ND	< +
Blastocystis Hominis	ND	< +
Other Parasites	ND	< +

COMMENTS:

MICROORGANISM SUMMARY

BENEFICIAL BACTERIA LEVELS LOW:

Consider possible causes and symptoms include antibiotics use, chlorinated water consumption, food allergy or sensitivity, IBS, IBD, inadequate dietary fiber or water, low intestinal sIgA, maldigestion, NSAIDs use, nutrient insufficiencies, parasite infection and slow transit time.

Ideally, Bifidobacteria should be recovered at levels of 4+, whilst Lactobacillus and E. coli should be 2+ or greater.

To Improve the levels of beneficial bacteria follow the four R's:

REMOVE

- Allergenic foods, Alcohol, NSAIDs, Pathogens, Sugar, refined carbohydrates, saturated fat, red meat, fermented foods

REPLACE

- Supplement hydrochloride, digestive enzymes or other digestive aids (see pancreatic elastase 1 results)

REINOCULATE

- Prebiotic and probiotic supplementation (see bacterial culture results)

REPAIR

- Use nutraceutical agents that will help heal the gastrointestinal lining. eg. L-glutamine, aloe vera, zinc, slippery elm.

Adequate levels of Bifidobacteria detected.

Klebsiella sp. PRESENT:

Klebsiella is 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.

Klebsiella forms part of the normal GI flora in small numbers, but can be an opportunistic pathogen.

Currently, standard texts provide no specific antimicrobial guidelines for GI overgrowth of Klebsiella. Klebsiella organisms are resistant to multiple antibiotics. Treatment depends on the organ system involved.

CITROBACTER PRESENT:

Citrobacter is considered an opportunistic pathogen and therefore can be found in the gut as normal flora. It is occasionally implicated in diarrheal disease, particularly C. freundii, C. diversus and C. koseri.

Treatment: Currently no specific antimicrobial guidelines for GI overgrowth of Citrobacter exist.

Carbapenems and fluoroquinolones are the antibiotics of choice for extra-intestinal sites.

Low numbers of the bacteria should be ignored whilst supplementing with adequate levels of probiotics if indicated.

ANTIBIOTIC SENSITIVITIES and NATURAL INHIBITORS

	Klebsiella oxytoca	Citrobacter freundii	Citrobacter species
Antibiotics	Susceptible	Susceptible	Susceptible
Penicillin.	YES	NO	NO
Ampicillin	NO	NO	NO
Erythromycin	NO	NO	NO
Tetracycline	YES	YES	YES
Sulphonamides	YES	YES	YES
Trimethoprim	YES	YES	YES
Ciprofloxacin	YES	YES	YES
Gentamycin.	NO	NO	NO
Ticarcillin	NO	NO	NO
Tobramycin	NO	NO	NO
Augmentin	NO	NO	NO
Cephalexin	YES	NO	NO
Inhibitors	Inhibition %	Inhibition %	Inhibition %
Berberine	60%	60%	100.00
Oregano	60%	60%	80.00
Plant Tannins	60%	100%	100.00
Uva-Ursi	60%	100%	80.00

LEGEND

Low Inhibition

High Inhibition

0	20	40	60	80	100
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YEAST - SENSITIVITIES and NATURAL ANTIFUNGALS

Geotrichum species

Antifungals

Inhibition

Fluconazole

64=NI

Voriconazole

Itraconazole

0.5=NI

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 inhibition 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 efficacy 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 interpretation for these organisms

Non-absorbed Antifungals

Inhibition %

Nystatin

60%

Natural Antifungals

Inhibition %

Berberine.

20%

Caprylic Acid

20%

Garlic

60%

Undecylenic Acid

60%

Uva-Ursi.

80%

LEGEND

Low Inhibition

High Inhibition





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PATHOGEN SUMMARY

OTHER BACTERIA PRESENT:

Organism	Result	Range	Classification
gamma-haemolytic Streptococcus	3+	0 - 3+	Non-Pathogen
Citrobacter freundii	4+ * H	0 - 3+	POSSIBLE Pathogen
Citrobacter species	3+	0 - 3+	Non-Pathogen
Klebsiella oxytoca	3+	0 - 3+	Non-Pathogen

OTHER YEASTS PRESENT:

Organism	Result	Range	Classification
Geotrichum species	2+ * H	0 - 1+	POSSIBLE Pathogen

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

Treatment:

Currently, standard texts provide no specific antimicrobial guidelines for GI overgrowth of Citrobacter. Carbapenems and fluoroquinolones 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 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 fluoroquinolones are the recommended antimicrobial agents for extra-intestinal sites.

Other Herbal antimicrobials include:

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

GEOTRICHUM SPECIES:

Geotrichum are yeast belonging to the Endomycetaceae 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 have been recommended for extra intestinal infections. Susceptibility testing is advised owing to increasing drug resistance.