

Comprehensive Digestive Stool Analysis



Gastrointestinal complaints are one of the most common reasons for which patients seek help from health professionals. By performing a Comprehensive Digestive Stool Analysis (CDSA), valuable information can be gained that normal stool pathology testing, gastroscopy or colonoscopy may miss. Doing a CDSA gives insight into what is going on in the bowel. Much of the guess work is taken out of diagnosis and treatment can be monitored more effectively.

How does a Comprehensive Digestive Stool Analysis differ from a normal stool test performed by a routine pathology service?

A routine pathology stool test mainly looks for pathogenic micro-organisms (e.g. pathogenic bacteria, worms, parasites). Therefore micro-organisms like yeast or other bacteria which would be useful to know if they are present are not reported, as they are not considered pathogenic. A CDSA will report on:

- | | | |
|--|---|--|
| ✓ Beneficial bacteria | ✓ Digestive and absorption function | ✓ If the laboratory can successfully culture the yeast or pathogenic bacteria detected, they will perform sensitivity testing to determine which pharmaceutical or natural product the micro-organism is susceptible to. |
| ✓ Imbalanced bacteria | ✓ Gut inflammatory markers | |
| ✓ Pathogenic bacteria | ✓ Gut immunology | |
| ✓ Yeast | ✓ Short chain fatty acid profile | |
| ✓ Parasites (additional option with some laboratories) | ✓ Intestinal health markers (blood, pH) | |

This is a valuable diagnostic tool that gives an impressive insight into the health of our gastrointestinal tract.

Types of Comprehensive Digestive Stool Analysis Tests Available

Health practitioners now have an option to use laboratories that perform testing using primarily **culture technique** or **PCR (DNA) analysis**. Both have their advantages and disadvantages. Which type of test to order depends on what you are hoping to achieve by doing a stool test. Generally, culture technique will grow what is present in the stool. PCR technology looks specifically for the presence of between 120 to 170 bacterial species in the stool sample. Simply put, culture techniques grow what is there in the stool. PCR techniques utilise probes to see if certain bacteria are present. Therefore, if there is a specific bug that you are looking for, a PCR stool test would probably be more suitable.

Who would benefit from a Comprehensive Digestive Stool Analysis?

Gastrointestinal function is critical for good health. When the gut bacteria are imbalanced and there are other underlying problems like inflammation and immune weakness, the scientific literature has clearly shown this to be associated with a wide variety of common illnesses including, but not limited to:

- Irritable Bowel Syndrome (IBS)
- Inflammatory Bowel Disease (IBD)
- Autoimmune Disorders
- Mood disorders
- Chronic Constipation / Loose Stools
- Rheumatic Disorders

Balancing gut microbiota is essential for improving core gastrointestinal functions, such as digestion and absorption of nutrients, as well as metabolic functions. Poor digestion and malabsorption may impact immune function, optimum nutritional status, and mood.



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**Taking the
guesswork out
of diagnosis**

What do the tests look like and how can they be useful?

Each laboratory produces reports in their own format. However, the following will give you an idea what I am seeing in clinic and why the Comprehensive Digestive Stool Analysis test is so useful.

A sample culture CDSA result indicating this patient has a serious imbalance of beneficial flora, with some commensal flora taking over, and dysbiotic or pathogenic flora also present.

BACTERIOLOGY CULTURE		
Expected/Beneficial flora	Commensal (Imbalanced) flora	Dysbiotic flora
3+ Bacteroides fragilis group	3+ Alpha hemolytic strep	3+ Escherichia coli ESBL
NG Bifidobacterium spp.	2+ Citrobacter freundii	3+ Klebsiella pneumoniae ssp pneumoniae
4+ Escherichia coli	2+ Morganella morganii ssp morganii	
1+ Lactobacillus spp.	1+ Staphylococcus aureus	
3+ Enterococcus spp.		
1+ Clostridium spp.		
NG = No Growth		

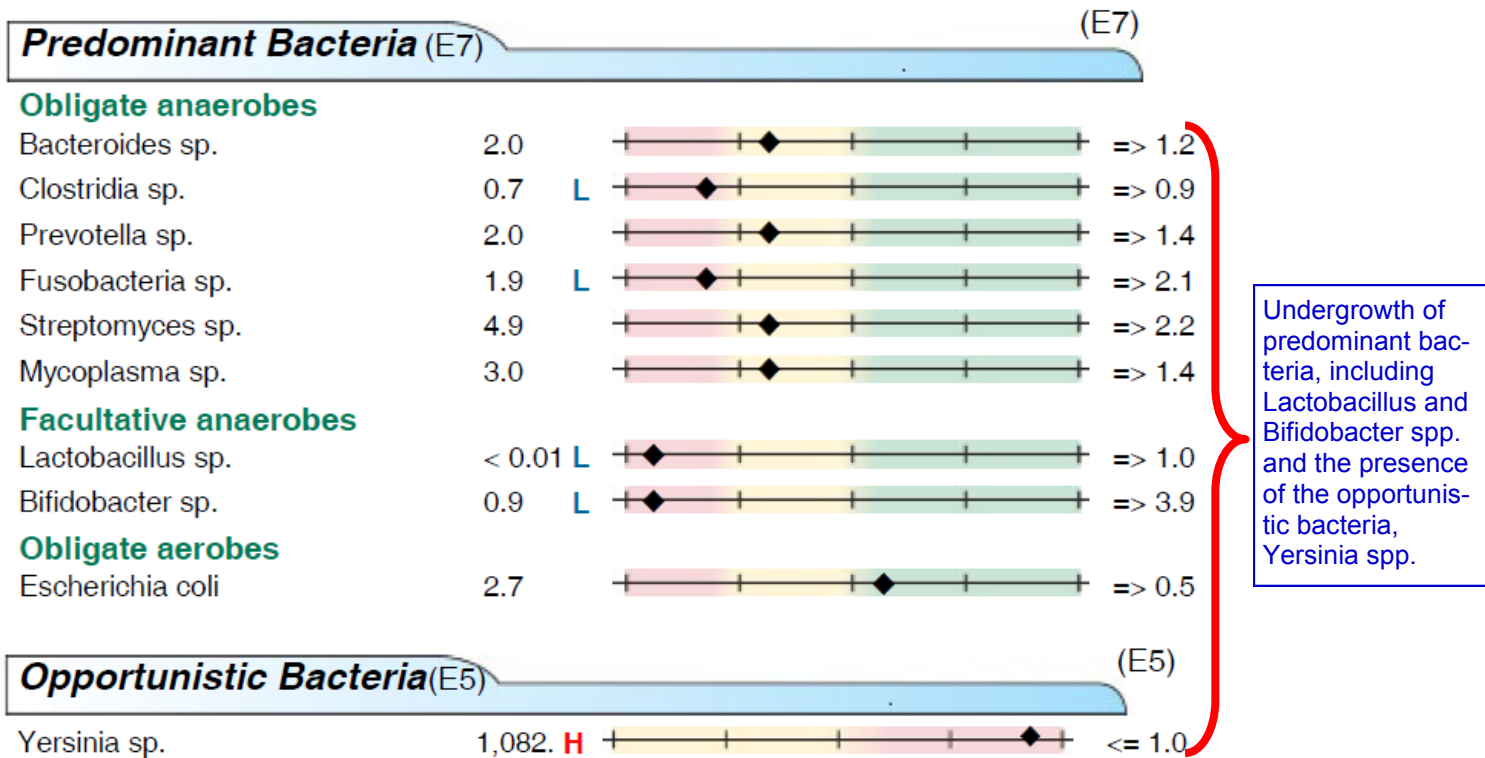
In a healthy gut we do not expect to see Imbalanced or Dysbiotic flora.

Few Blastocystis hominis
Rare Yeast

There is severe undergrowth of Bifidobacterium and Lactobacillus spp. bacteria. These are two of the predominant resident bacteria in the bowel to help control other bacteria, yeast, and some parasites from getting out of control.

Clinical picture: patient has had ongoing loose stools, abdominal pain, lethargy, and a mood disorder. Has been evaluated by a gastroenterologist with a gastroscopy and colonoscopy. Blastocystis was been previously detected by routine pathology and treated with antibiotics. In addition to the above results, parasitology also indicated the presence of Blastocystis (indicating inadequate treatment with antibiotics previously), yeast (Candida and Saccharomyces), as well as positive inflammatory markers and other abnormal markers on the test.

A sample PCR (DNA) result indicating this patient has low levels of predominant bacteria.



Undergrowth of predominant bacteria, including Lactobacillus and Bifidobacter spp. and the presence of the opportunistic bacteria, Yersinia spp.

Clinical picture: This was an young autistic boy with ongoing bowel issues, predominantly constipation, bloating and flatulence with very narrow food preferences. In addition to the above results yeast was also detected as well as abnormal digestion and absorption markers.

Digestion and Absorption Markers

DIGESTION / ABSORPTION

	Within	Outside	Reference Range
Elastase	 	132	> 200 µg/mL
Fat Stain	None	 	None - Mod
Muscle fibers	None	 	None - Rare
Vegetable fibers	Rare	 	None - Few
Carbohydrates	Neg	 	Neg

Digestion

Elastase is a pancreatic enzyme excreted by the pancreas exclusively and is a direct correlation with pancreatic function. It is used to test for insufficient pancreatic function.

Muscle, vegetable fibers and carbohydrates are also markers of poor digestion

Absorption

Fat stain detects the ability to absorb fats from the gut.

Gastrointestinal Inflammation Markers

INFLAMMATION

	Within	Outside	Reference Range
Lysozyme*	 	1030	<= 600 ng/mL
Lactoferrin	 	11.1	< 7.3 µg/mL
White Blood Cells	None	 	None - Rare
Mucus	Neg	 	Neg

Inflammation

Lysozyme, lactoferrin, white blood cells and mucus are all indicators of inflammation. Lysozyme is an enzyme secreted at the site of inflammation. Lactoferrin is a specific marker of inflammation and is used to diagnose and differentiate IBS from inflammatory bowel disease (IBD).

This result was particularly interesting as it was from a 2 year old ASD child, that was constantly crying miserable and would not drink any fluids. He had a gastroscopy performed prior to CDSA testing and the gastroenterologist found nothing abnormal! The CDSA result indicates that he had an inflammatory bowel issue. A colonoscopy may have been more appropriate. He settled nicely within 2 months of treatment, however it took another 6 months before he began to accept fluids orally.

Gastrointestinal Immune Marker

IMMUNOLOGY

	Within	Outside	Reference Range
Secretory IgA*	 	253	51 - 204mg/dL

Immunology

Secretory IgA (sIgA) is an antibody that is secreted by the gut lining and is the first line of defence for the lining of the gut. Elevated levels of sIgA have been associated with an up regulated immune response.

This result is also from the same 2 year old child as discussed above. His immune system was desperately trying to contain the gut bacteria at the inflamed mucosal lining. No wonder he was miserable.

Intestinal Health Markers

INTESTINAL HEALTH MARKERS

	Within	Outside	Reference Range
Red Blood Cells	None	 	None - Rare
pH	 	5.8	6 - 7.8
Occult Blood	 	Pos	Neg

Intestinal Health

Red blood cells (RBC) in the stool may be an inflammatory bowel condition such as ulcerative colitis.

Faecal pH is an indication of bacterial fermentation of fibre within the bowel.

Occult blood indicates the presence of blood, usually from the upper digestive tract.

Red blood cells or occult blood always warrants further investigation to rule out more serious medical issues.

Short Chain fatty Acids

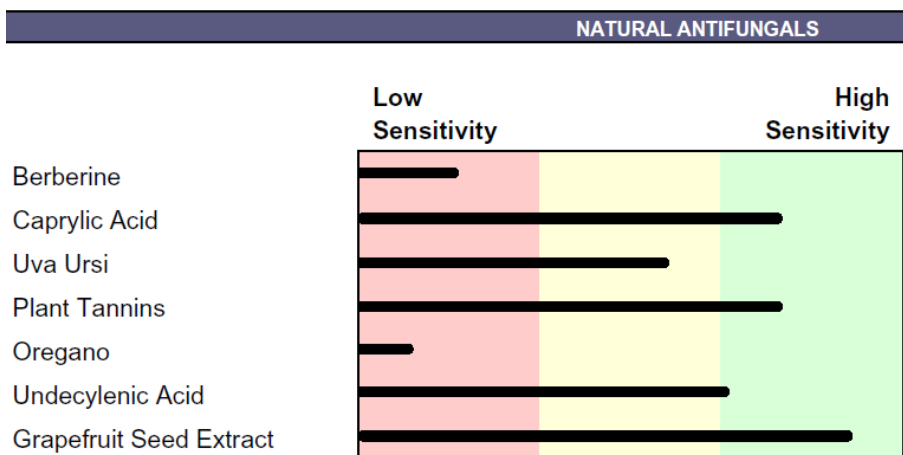
SHORT CHAIN FATTY ACIDS			
	Within	Outside	Reference Range
% Acetate	66		36 - 74 %
% Propionate	16		9 - 32 %
% Butyrate	18		9 - 39 %
% Valerate		0.4	1 - 8 %
Butyrate	2.4		0.8 - 3.8 mg/mL
Total SCFA's	13		4 - 14 mg/mL

Short Chain fatty Acids (SCFAs)

Beneficial **SCFAs** are produced from dietary carbohydrates that have escaped digestion or absorption in the small intestine or from fibre and prebiotics that have undergone fermentation in the colon. SCFAs play an important role in the health of the gut as well as protecting against intestinal dysbiosis.

Susceptibility Testing

Yeast Susceptibilities: Candida parapsilosis



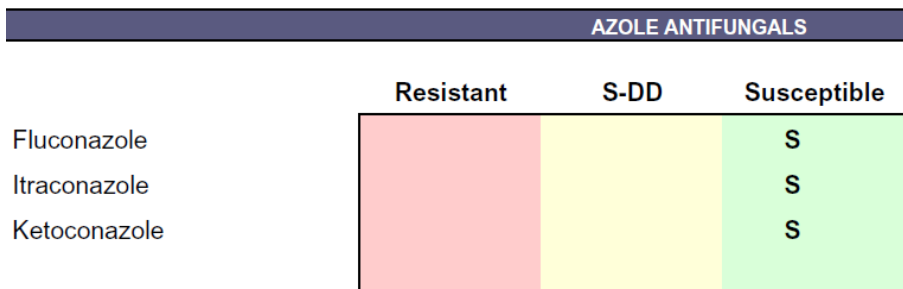
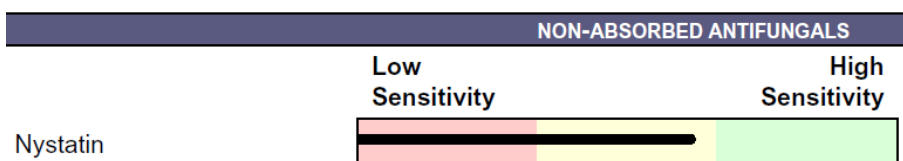
Susceptibility Testing

This component of the CDSA is a valuable addition to planning treatment. Any yeast or pathogenic bacteria that can be isolated and grown can be tested against both natural and pharmaceutical products to see which products the micro-organism is most sensitive to, and effectively eradicate it.

In the sample result if one chooses to use natural products, the products of choice would be grape fruit seed extract, caprylic acid and plant tannins.

If choosing to use pharmaceutical drugs, the azole antifungals would probably be a better choice over Nystatin.

Please note that not all laboratories do sensitivity testing on



This is only a sample of the type of results that different CDSA testing laboratories have to offer. There will be differences between what individual laboratories test for. Ultimately knowing what you would like to detect determines which laboratory you choose. The complexity of the testing also reflects the cost, testing can cost anything between \$300 and \$700. Although this may seem like a lot of money, wasting money going from one gastroenterologist to another or from one naturopath to another, using the wrong antimicrobials or antifungals costs even more in the long-term.