Nordic Laboratories

PATIENT:	**Sample Report**			TEST REF:	**TST-XXXXXX**
TEST NUMBER:	FXXXXXXX	COLLECTED:	dd/mm/yyyy	PRACTITIONER:	**Nordic Laboratories**
PATIENT NUMBER:	PXXXXXXX	RECEIVED:	dd/mm/yyyy	ADDRESS:	Nygade 6, 3.sal 1164 Copenhagen K
GENDER:	Female	TESTED:	dd/mm/yyyy		
AGE:	48				
DATE OF BIRTH:	dd/mm/yyyy				

TEST NAME: Comprehensive Stool Analysis & Parasitology x2 (CSAPx2)

Comprehensive Stool Analysis / Parasitology x2

BACTERIOLOGY CULTURE

Expected/Beneficial flora	Commensal (Imbalanced) flora	Dysbiotic flora
3+ Bacteroides fragilis group	3+ Alpha hemolytic strep	
4+ Bifidobacterium spp.	2+ Pseudomonas aeruginosa	
3+ Escherichia coli		
4+ Lactobacillus spp.		
NG Enterococcus spp.		
NG Clostridium spp.		

NG = No Growth

BACTERIA INFORMATION

Expected /Beneficial bacteria make up a significant portion of the total microflora in a healthy & balanced GI tract. These beneficial bacteria have many health-protecting effects in the GI tract including manufacturing vitamins, fermenting fibers, digesting proteins and carbohydrates, and propagating anti-tumor and anti-inflammatory factors.
Clostridia are prevalent flora in a healthy intestine. Clostridium spp. should be considered in the context of balance with other expected/beneficial flora. Absence of clostridia or over abundance relative to other expected/beneficial flora indicates bacterial imbalance. If *C. difficile* associated disease is suspected, a Comprehensive Clostridium culture or toxigenic *C. difficile* DNA test is recommended.
Commensal (Imbalanced) 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. They can be present due to a number of factors including: consumption of contaminated water or food, exposure to chemicals that are toxic to beneficial bacteria; the use of antibiotics, oral contraceptives or other medications; poor fiber intake and high stress levels.

YEAST CULTURE

Normal flora	Dysbiotic flora
1+ Candida albicans	

MICROSCOPIC YEAST

Result:	Expected:
Mod	None - Rare

The microscopic finding of yeast in the stool is helpful in identifying whether there is proliferation of yeast. Rare yeast may be normal; however, yeast observed in higher amounts (few, moderate, or many) is abnormal.

YEAST INFORMATION

Yeast normally can be found in small quantities in the skin, mouth, intestine and mucocutaneous junctions. Overgrowth of yeast can infect virtually every organ system, leading to an extensive array of clinical manifestations. Fungal diarrhea is associated with broad-spectrum antibiotics or alterations of the patient's immune status. Symptoms may include abdominal pain, cramping and irritation. When investigating the presence of yeast, disparity may exist between culturing and microscopic examination. Yeast are not uniformly dispersed throughout the stool, this may lead to undetectable or low levels of yeast identified by microscopy, despite a cultured amount of yeast. Conversely, microscopic examination may reveal a significant amount of yeast present, but no yeast cultured. Yeast does not always survive transit through the intestines rendering it unvialble.

Comments:

***Aeromonas, Campylobacter, Plesiomonas, Salmonella, Shigella, Vibrio, Yersinia, & Edwardsiella tarda* have been specifically tested for and found absent unless reported.**

MALDI-TOF

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TEST NAME: Comprehensive Stool Analysis & Parasitology x2 (CSAPx2)

Comprehensive Stool Analysis / Parasitology x2

PARASITOLOGY/MICROSCOPY *

Sample 1

Rare Blastocystis hominis
Mod Yeast

Sample 2

Rare Blastocystis hominis
Mod Yeast

***A trichrome stain and concentrated iodine wet mount slide is read for each sample submitted.**

PARASITOLOGY INFORMATION

Intestinal parasites are abnormal inhabitants of the gastrointestinal tract that have the potential to cause damage to their host. The presence of any parasite within the intestine generally confirms that the patient has acquired the organism through fecal-oral contamination. Damage to the host includes parasitic burden, migration, blockage and pressure. Immunologic inflammation, hypersensitivity reactions and cytotoxicity also play a large role in the morbidity of these diseases. The infective dose often relates to severity of the disease and repeat encounters can be additive.

There are two main classes of intestinal parasites, they include protozoa and helminths. The protozoa typically have two stages; the trophozoite stage that is the metabolically active, invasive stage and the cyst stage, which is the vegetative inactive form resistant to unfavorable environmental conditions outside the human host. Helminths are large, multicellular organisms. Like protozoa, helminths can be either free-living or parasitic in nature. In their adult form, helminths cannot multiply in humans.

In general, acute manifestations of parasitic infection may involve diarrhea with or without mucus and or blood, fever, nausea, or abdominal pain. However these symptoms do not always occur. Consequently, parasitic infections may not be diagnosed or eradicated. If left untreated, chronic parasitic infections can cause damage to the intestinal lining and can be an unsuspected cause of illness and fatigue. Chronic parasitic infections can also be associated with increased intestinal permeability, irritable bowel syndrome, irregular bowel movements, malabsorption, gastritis or indigestion, skin disorders, joint pain, allergic reactions, and decreased immune function.

In some instances, parasites may enter the circulation and travel to various organs causing severe organ diseases such as liver abscesses and cysticercosis. In addition, some larval migration can cause pneumonia and in rare cases hyper infection syndrome with large numbers of larvae being produced and found in every tissue of the body.

One negative parasitology x1 specimen does not rule out the possibility of parasitic disease, parasitology x3 is recommended. This exam is not designed to detect Cryptosporidium spp, Cyclospora cayetanensis or Microsproridia spp.

GIARDIA/CRYPTOSPORIDIUM IMMUNOASSAY

	Within	Outside	Reference Range
Giardia intestinalis	**Neg**		Neg
Cryptosporidium	**Neg**		Neg

Giardia intestinalis (lamblia) is a protozoan that infects the small intestine and is passed in stool and spread by the fecal-oral route. Waterborne transmission is the major source of giardiasis.
Cryptosporidium is a coccidian protozoa that can be spread from direct person-to-person contact or waterborne transmission.

Comments:

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Comprehensive Stool Analysis / Parasitology x2

DIGESTION /ABSORPTION

	Within	Outside	Reference Range
Elastase	**420**		> 200 µg/mL
Fat Stain	**Few**		None - Mod
Muscle fibers	**None**		None - Rare
Vegetable fibers	**Rare**		None - Few
Carbohydrates	**Neg**		Neg

Elastase findings can be used for the diagnosis or the exclusion of exocrine pancreatic insufficiency. Correlations between low levels and chronic pancreatitis and cancer have been reported. **Fat Stain:** Microscopic determination of fecal fat using Sudan IV staining is a qualitative procedure utilized to assess fat absorption and to detect steatorrhea. **Muscle fibers** in the stool are an indicator of incomplete digestion. Bloating, flatulence, feelings of "fullness" may be associated with increase in muscle fibers. **Vegetable fibers** in the stool may be indicative of inadequate chewing, or eating "on the run". **Carbohydrates:** The presence of reducing substances in stool specimens can indicate carbohydrate malabsorption.

INFLAMMATION

	Within	Outside	Reference Range
Lactoferrin	**< 0.5**		< 7.3 µg/mL
Calprotectin*	**< 10**		10 - 50 µg/g
Lysozyme*	**314**		<= 600 ng/mL
White Blood Cells	**None**		None - Rare
Mucus		**Pos**	Neg

Lactoferrin and **Calprotectin** are reliable markers for differentiating organic inflammation (IBD) from function symptoms (IBS) and for management of IBD. Monitoring levels of fecal lactoferrin and calprotectin can play an essential role in determining the effectiveness of therapy, are good predictors of IBD remission, and can indicate a low risk of relapse. **Lysozyme*** is an enzyme secreted at the site of inflammation in the GI tract and elevated levels have been identified in IBD patients. **White Blood Cells** (WBC) and **Mucus** in the stool can occur with bacterial and parasitic infections, with mucosal irritation, and inflammatory bowel diseases such as Crohn's disease or ulcerative colitis.

IMMUNOLOGY

	Within	Outside	Reference Range
Secretory IgA*	**157**		51 - 204 mg/dL

Secretory IgA* (sIgA) is secreted by mucosal tissue and represents the first line of defense of the GI mucosa and is central to the normal function of the GI tract as an immune barrier. Elevated levels of sIgA have been associated with an upregulated immune response.

Comments:

*For Research Use Only. Not for use in diagnostic procedures.

Methodology: **Elisa, Microscopy, Colormetric, Gas Chromotography, ph Electrode**

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Comprehensive Stool Analysis / Parasitology x2

SHORT CHAIN FATTY ACIDS

	Within	Outside	Reference Range
% Acetate	68		40 - 75 %
% Propionate	9.5		9 - 29 %
% Butyrate	21		9 - 37 %
% Valerate	1.4		0.5 - 7 %
Butyrate	2.5		0.8 - 4.8 mg/mL
Total SCFA's	12		4 - 18 mg/mL

Short chain fatty acids (SCFAs): SCFAs are the end product of the bacterial fermentation process of dietary fiber by beneficial flora in the gut and play an important role in the health of the GI as well as protecting against intestinal dysbiosis. Lactobacilli and bifidobacteria produce large amounts of short chain fatty acids, which decrease the pH of the intestines and therefore make the environment unsuitable for pathogens, including bacteria and yeast. Studies have shown that SCFAs have numerous implications in maintaining gut physiology. SCFAs decrease inflammation, stimulate healing, and contribute to normal cell metabolism and differentiation. Levels of **Butyrate** and **Total SCFA** in mg/mL are important for assessing overall SCFA production, and are reflective of beneficial flora levels and/or adequate fiber intake.

INTESTINAL HEALTH MARKERS

	Within	Outside	Reference Range
Red Blood Cells	None		None - Rare
pH		5.7	6 - 7.8
Occult Blood	Neg		Neg

Red Blood Cells (RBC) in the stool may be associated with a parasitic or bacterial infection, or an inflammatory bowel condition such as ulcerative colitis. Colorectal cancer, anal fistulas, and hemorrhoids should also be ruled out.
pH: Fecal pH is largely dependent on the fermentation of fiber by the beneficial flora of the gut.
Occult blood: A positive occult blood indicates the presence of free hemoglobin found in the stool, which is released when red blood cells are lysed.

MACROSCOPIC APPEARANCE

	Appearance	Expected
Color	Brown	Brown
Consistency	Soft	Formed/Soft

Color: Stool is normally brown because of pigments formed by bacteria acting on bile introduced into the digestive system from the liver. While certain conditions can cause changes in stool color, many changes are harmless and are caused by pigments in foods or dietary supplements. **Consistency:** Stool normally contains about 75% water and ideally should be formed and soft. Stool consistency can vary based upon transit time and water absorption.

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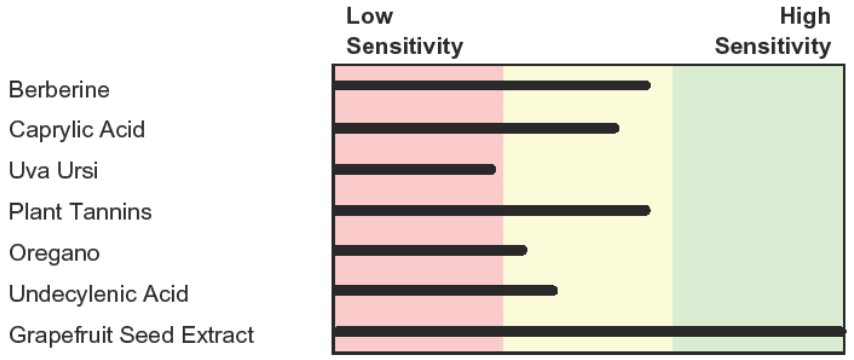
TEST NAME: Comprehensive Stool Analysis & Parasitology x2 (CSAPx2)

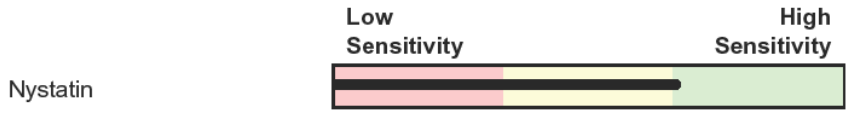
Yeast Susceptibilities: Candida albicans

NATURAL ANTIFUNGALS



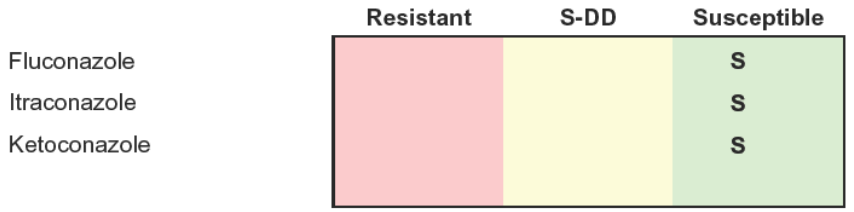
Natural antifungal agents may be useful for treatment of patients when organisms display in-vitro sensitivity to these agents. The test is performed by using standardized techniques and filter paper disks impregnated with the listed agent. Relative sensitivity is reported for each natural agent based upon the diameter of the zone of inhibition surrounding the disk. Data based on over 5000 individual observations were used to relate the zone size to the activity level of the agent. A scale of relative sensitivity is defined for the natural agents tested.

NON-ABSORBED ANTIFUNGALS



Non-absorbed antifungals may be useful for treatment of patients when organisms display in-vitro sensitivity to these agents. The test is performed using standardized commercially prepared disks impregnated with Nystatin. Relative sensitivity is reported based upon the diameter of the zone of inhibition surrounding the disk.

AZOLE ANTIFUNGALS



Susceptible results imply that an infection due to the fungus may be appropriately treated when the recommended dosage of the tested antifungal agent is used.
Susceptible - Dose Dependent (S-DD) results imply that an infection due to the fungus may be treated when the highest recommended dosage of the tested antifungal agent is used.
Resistant results imply that the fungus will not be inhibited by normal dosage levels of the tested antifungal agent.

Standardized test interpretive categories established for Candida spp. are used for all yeast isolates.

Comments:

Yeast antifungal susceptibility testing is intended for research use only.
Not for use in diagnostic procedures.

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TEST NAME: Comprehensive Stool Analysis & Parasitology x2 (CSAPx2)

INTRODUCTION

This analysis of the stool specimen provides fundamental information about the overall gastrointestinal health of the patient. When abnormal microflora or significant aberrations in intestinal health markers are detected, specific interpretive paragraphs are presented. If no significant abnormalities are found, interpretive paragraphs are not presented.

Imbalanced flora

Imbalanced flora are those bacteria that reside in the host gastrointestinal tract and neither injure nor benefit the host. Certain dysbiotic bacteria may appear under the imbalances category if found at low levels because they are not likely pathogenic at the levels detected. When imbalanced flora appear, it is not uncommon to find inadequate levels of one or more of the beneficial bacteria and/or a fecal pH which is more towards the alkaline end of the reference range (6 - 7.8). It is also not uncommon to find hemolytic or mucoid E. coli with a concomitant deficiency of beneficial E. coli and alkaline pH, secondary to a mutation of beneficial E. coli in alkaline conditions (DDI observations). Treatment with antimicrobial agents is unnecessary unless bacteria appear under the dysbiotic category.

Mackowiak PA. The normal microbial flora. N Engl J Med. 1982;307(2):83-93.

Cultured Yeast

Yeast, such as Candida are normally present in the GI tract in very small amounts. Many species of yeast exist and are commensal; however, they are always poised to create opportunistic infections and have detrimental effects throughout the body. Factors that contribute to a proliferation of yeast include frequent use of wide-spread antibiotics/low levels of beneficial flora, oral contraceptives, pregnancy, cortisone and other immunosuppressant drugs, weak immune system/low levels of sIgA, high-sugar diet, and high stress levels.

When investigating the presence of yeast, disparity may exist between culturing and microscopic examination. Yeast grows in colonies and is typically not uniformly dispersed throughout the stool. This may lead to undetectable or low levels of yeast identified by microscopy, despite a cultured amount of yeast. Conversely, microscopic examination may reveal a significant amount of yeast present, but no yeast cultured. Yeast does not always survive transit through the intestines rendering it unviable for culturing. Therefore, both microscopic examination and culture are helpful in determining if abnormally high levels of yeast are present.

Microscopic yeast

Microscopic examination has revealed yeast in this stool sample. The microscopic finding of yeast in the stool is helpful in identifying whether the proliferation of fungi, such as Candida albicans, is present. Yeast is normally found in very small amounts in a healthy intestinal tract. While small quantities of yeast (reported as none or rare) may be normal, yeast observed in higher amounts (few, moderate to many) is considered abnormal.

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An overgrowth of intestinal yeast is prohibited by beneficial flora, intestinal immune defense (secretory IgA), and intestinal pH. Beneficial bacteria, such as Lactobacillus colonize in the intestines and create an environment unsuitable for yeast by producing acids, such as lactic acid, which lowers intestinal pH. Also, lactobacillus is capable of releasing antagonistic substances such as hydrogen peroxide, lactocidin, lactobacillin, and acidolin.

Many factors can lead to an overgrowth of yeast including frequent use of antibiotics (leading to insufficient beneficial bacteria), synthetic corticosteroids, oral contraceptives, and diets high in sugar. Although there is a wide range of symptoms which can result from intestinal yeast overgrowth, some of the most common include brain fog, fatigue, reccurring vaginal or bladder infections, sensitivity to smells (perfumes, chemicals, environment), mood swings/depression, sugar and carbohydrate cravings, gas/bloating, and constipation or loose stools.

A positive yeast culture (mycology) and sensitivity to prescriptive and natural agents is helpful in determining which anti-fungal agents to use as part of a therapeutic treatment plan for chronic colonic yeast. However, yeast are colonizers and do not appear to be dispersed uniformly throughout the stool. Yeast may therefore be observed microscopically, but not grow out on culture even when collected from the same bowel movement.

Parasites

Parasites were detected by microscopic examination in this stool specimen. Intestinal parasites are abnormal inhabitants of the GI tract that live off and have the potential to cause damage to their host. Factors such as contaminated food and water supplies, day care centers, increased international travel, pets, carriers such as mosquitoes and fleas, and sexual transmission have contributed to an increased prevalence of intestinal parasites.

In general, acute manifestations of parasitic infection may involve diarrhea with or without mucus and/or blood, fever, nausea, or abdominal pain. However, these symptoms do not always occur. Consequently, parasitic infections may not be diagnosed and eradicated. If left untreated, chronic parasitic infections can cause damage to the intestinal lining and can be an unsuspected cause of illness and fatigue. Chronic parasitic infections can also be associated with increased intestinal permeability, irritable bowel syndrome, irregular bowel movements, malabsorption, gastritis or indigestion, skin disorders, joint pain, allergic reactions, decreased immune function, and fatigue.

Murray MT. Stomach Ailments And Digestive Disturbances. Rocklin, CA: Prima Publishing;1997.

Gittleman AL. Guess What Came to Dinner Parasites And Your Health. New York, NY: Penguin Group; 2001.

Blastocystis hominis

Blastocystis hominis was identified in this specimen. Blastocystis hominis is a common protozoan found throughout the world. Blastocystis is transmitted via the fecal-oral route or from contaminated food or water.

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Whether Blastocystis infection can cause symptoms is still considered controversial. Symptoms may be compounded by concomitant infection with other parasitic organisms, bacteria, or viruses. Often, B. hominis is found along with other such organisms. Nausea, diarrhea, abdominal pain, anal itching, weight loss, and excess gas have been reported in some persons with Blastocystis infection.

Metronidazole has been the traditionally considered the most effective drug (recommended adult dosage varies from 250 mg bid for 5-7 days to 750 mg tid x 10 days). Iodoquinol 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 symptomatology. Various herbs may be effective, including oil of oregano. Limit refined carbohydrates in diet.

For more information:

1. Albrecht H, Stellbrink HJ, Koperski K, et al. Blastocystis hominis in human immunodeficiency virus-related diarrhea. Scand J Gastroenterol 1995;30:909-14.
2. Markell EK, Udkow MP. Blastocystis hominis: pathogen or fellow traveler Am J Trop Med Hyg 1986;35:1023-6.
3. Miller RA, Minshew BH. Blastocystis hominis: An organism in search of a disease. Rev Infect Dis 1988;10:930-8.
4. Udkow MP, Markell EK. Blastocystis hominis: prevalence in asymptomatic versus symptomatic hosts. J Infect Dis 1993;168:242-4.
5. Zuckerman MJ, Watts MT, Ho H., et al. Blastocystis hominis infection and intestinal injury. Am J Med Sci 1994;308:96-101.

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Abramowicz, M. The Medical Letter On Drugs and Therapeutics. Drugs For Parasitic Infections. New Rochelle (NY): The Medical Letter, Inc.

Beers, M. H., & Berkow, R. (Eds.). The Merck Manual of Diagnosis and Therapy Online. http://www.merck.com/mrkshared/mmanual/section13/chapter161/161a.jsp, Accessed August, 2005.

CDC Division of Parasitic Diseases website. http://www.cdc.gov/ncidod/dpd/default.htm, Accessed August, 2005.

Garcia, LS. Diagnostic Medical Parasitology. 4th ed. Washington DC: ASM; 2001; 6.

Leber AL, Movak SM In: Murray PR, Baron EJ, Pfaller MA, Tenover FC, Yolken RH, eds. Manual of Clinical Microbiology. 7th ed. Washington DC: ASM Press; 1999; 1401.

Mucus

Mucus was detected in this specimen. The presence of pus or mucus in the stool may result from prolonged irritation to the intestinal mucosa and may be secondary to a proliferation of GI enteropathogens such as bacteria [1-3], yeast [4], or parasites [4,5]. It can also be associated with an inflammatory bowel condition [6,7]. Mucus is also secreted by the intestinal mucosa in response to parasympathetic excitability such as spastic constipation, mucus colitis, neoplasm of the rectum, or villous adenoma of the colon [8]. A positive mucus result requires treatment of the cause of inflammation and possibly anti-inflammatory therapy. Microbial and microscopic studies of the stool are useful detecting dysbiotic bacteria, fungi, or parasites. Localized abscesses and inflammatory disorders should also be ruled out.

1. Patwari Ak, Deb M, Dudeja M, Jayasheela M, et al. Clinical and laboratory predictors of invasive diarrhoea in children less than five years old. J Diarrhoeal Dis Res 1993;11(4):211-6.
2. Nelson EA, Mok TC, Yu LM. Retrospective comparison of management of gastro-enteritis in hospitalized children. Ann Trop Paediatr 2002;22(2):165-71.
3. de Boissieu D, Chaussain M, Badoual J, et al. Small bowel overgrowth bacterial overgrowth in children with chronic diarrhea, abdominal pain, or both. J Pediatr 1996;128(2):203-7.
4. Mishra OP, Dhawan T, Singla PN, et al. Endoscopic and histopathological evaluation of preschool children with chronic diarrhea. J Trop Pediatr 2001; 47(2):77-80.
5. Larrosa-Haro A, Ruiz-perez M, Aguilar-Benavidas. Utility of studying feces for the diagnosis and management of infanmts and preschool children with acute diarrhea. Salud publica Mex 2002;44(4):328-24.
6. Kwan AC, Hu WH, Chan YK, et al. Prevalence of irritable bowel syndrome in Hong Kong. J Gastroenterol Heapatol 2002;17(11):1180-6.
7. Pan G, Lu S, Han S. A study on the symptoms and diagnostic criteria of irritable bowel syndrome in Chinese. Zhonghua Nei Ke Za Zhi 1999;38(2):81-4.
8. Fischbach. A manual of laboratory and diagnostic tests. Philadelphia:

pH low

The pH of this stool sample (<6.0) is too acidic. Ideally, the pH of the stool is slightly acidic. This represents colonic pH, which is largely reflective of bacterial fermentation and putrefaction of intestinal contents. Healthy microflora such as Lactobacillus and Bifidus generate large amounts of short chain fatty acids (acetic, proprionic, butyric, and valeric), which lower colonic pH. Short chain fatty acids are byproducts of the bacterial fermentation process of dietary fiber by beneficial flora in the gut. An acidic pH, below 6.0, is usually reflective of a rapid transit time, e.g. diarrhea or loose stools. Further investigation as to the cause of diarrhea such as food allergy intolerance, viral, bacterial, parasitic infection, irritable bowel

syndrome may be warranted. Additionally, research has indicated that an acidic pH (< 6.0) is common in individuals with lactose malabsorption [1]. Unabsorbed lactose in the gut can be hydrolysed by colonic bacteria forming volatile fatty acids which cause the stool to become acidic, often times accompanied by a sweet, sickly stool odor [1]. Hydrolysis of unabsorbed lactose and fermentation by colonic bacteria can also produce hydrogen (and carbon dioxide) which is then absorbed and excreted in the breath. This is the basis for the test for lactose malabsorption (lactose intolerance breath test).

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Beneficial Flora

One or more of the expected or beneficial bacteria are low in this specimen. Normally abundant include lactobacilli, bifidobacteria, clostridia, Bacteroides fragilis group, enterococci, and some strains of Escherichia coli. The beneficial flora have many health-protecting effects in the gut, and as a consequence, are crucial to the health of the whole organism. Some of the roles of the beneficial flora include digestion of proteins and carbohydrates, manufacture of vitamins and essential fatty acids, increase in the number of immune system cells, break down of bacterial toxins and the conversion of flavinoids into anti-tumor and anti-inflammatory factors. Lactobacilli, bifidobacteria, clostridia, and enterococci secrete lactic acid as well as other acids including acetate, propionate, butyrate, and valerate. This secretion causes a subsequent decrease in intestinal pH, which is crucial in preventing an enteric proliferation of microbial pathogens, including bacteria and yeast. Many GI pathogens thrive in alkaline environments. Lactobacilli also secrete the antifungal and antimicrobial agents lactocidin, lactobacillin, acidolin, and hydrogen peroxide. The beneficial flora of the GI have thus been found useful in the inhibition of microbial pathogens, prevention and treatment of antibiotic associated diarrhea, prevention of traveler's diarrhea, enhancement of immune function, and inhibition of the proliferation of yeast.

In a healthy balanced state of intestinal flora, the beneficial flora make up a significant proportion of the total microflora. Healthy levels of each of the beneficial bacteria are indicated by either a 3+ or 4+ (0 to 4 scale). However, some individuals have low levels of beneficial bacteria and an overgrowth of nonbeneficial (imbalances) or even pathogenic microorganisms (dysbiosis). Often attributed to the use of antibiotics, individuals with low beneficial bacteria may present with chronic symptoms such as irregular transit time, irritable bowel syndrome, bloating, gas, chronic fatigue, headaches, autoimmune diseases (e.g., rheumatoid arthritis), and sensitivities to a variety of foods. Treatment may include the use of probiotic supplements containing various strains of lactobacillus and bifidobacterium species and consumption of cultured or fermented foods including yogurt, kefir, miso, tempeh and tamari sauce. Polyphenols in green and ginseng tea have been found to increase the numbers of beneficial bacteria. If dysbiosis is present, treatment may also include the removal of pathogenic bacteria, yeast, or parasites.

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