

The Digestive System: A key to your biological optimal performance

May 11, 2018

Good Health Begins In Your Gut



The Digestive System

Functions

Components

- Ingest food
- Break down food into nutrient molecules
- Absorb molecules into the bloodstream
- Rid the body of indigestible remains





Two Divisions of the **Digestive System**

- <u>Alimentary Canal</u>
 - Continuous, ~30 foot long muscular digestive tube winding throughout the body
 - Digests and absorbs food particles
 - Contains the following organs:
 - Mouth, Pharynx, Esophagus, Stomach, Small and Large Intestine
- <u>Accessory Digestive Organs</u>
 - Contains the following organs:
 - Teeth, Tongue, Salivary Glands, Liver, Gallbladder, Pancreas and Microbiome



Digestive Processes

- Ingestion
- Propulsion
- Mechanical digestion
- Chemical digestion
- Absorption
- Defecation





Mouth

 Teeth mechanically break down food into small pieces. Tongue mixes food with saliva (contains amylase, which helps break down starch).



Epiglottis is a flap-like structure at the back of the throat that closes over the trachea preventing food from entering it. It is located in the





Esophagus

- Approximately 20 cm long.
- Functions include:
- 1. Secrete mucus
- 2. Moves food from the throat to the stomach using muscle movement called peristalsis
- Acid from the stomach can reflux

and cause heartburn.





Stomach

- J-shaped muscular bag that stores the food you eat, breaks it down into tiny pieces.
- Mixes food with Digestive
 Juices that contain enzymes and



- HCl to break down **<u>Proteins and Lipids</u>**.
- Acid (HCl) in the stomach kills bacteria.
- Food found in the stomach is called Chyme.



Small Intestine

- Small intestines are roughly 7 meters long
- Lining of intestine walls has finger-like projections called villi, to increase surface area (laid out ~ a tennis court)
- The villi are covered in microvilli which further increases surface area









Small Intestine

- Nutrients from the food pass into the bloodstream through the small intestine walls.
- 90% of absorption occurs here
- Absorbs:
 - 80% ingested water
 - Vitamins
 - Minerals
 - Carbohydrates
 - Proteins
 - Lipids
 - Secretes digestive enzymes





Large Intestine

- About 1.5 meters long
- Functions:
 - Absorption of vitamins B and K produced by bacteria (the microflora)
 - Reabsorption of water & electrolytes
 - Concentrate wastes
 - Storage of fecal material prior to **defecation**





Accessory Digestive Organs

- Not part of the path of food, but play a critical role in the entire digestive process
- Includes: Liver, gall bladder, and pancreas
- Not yet considered an organ, the microbiome has all the functions of one





LIVER has so MANY functions

- filters out anything the body does not want to keep including drugs, alcohol and any toxin. It is our only organ that will grow back if a piece is removed







Digestive Functions of the Liver

- Filters and processes nutrient-rich blood of carbohydrates, proteins, and lipids from intestine
- Production and regulation of cholesterol
- Production of *bile* which emulsifies fats
- Removes drugs and hormones from circulation
- Storage of vitamins and minerals



Gall Bladder

- Stores bile produced in the liver, releases it into the small intestine to help digest fats
- Gallstones are a common problem
- Cholestectomy is one of the most common surgeries done in the US





Pancreas

- Unique gland with both exocrine and endocrine functions
- Exocrine produces digestive enzymes to digest fats, carbohydrates and proteins
- Endocrine produces glucagon and insulin to regulate





Human Microbiome

- Without our microflora we would
 become ill and not likely survive beyond 5 years
- Intestinal flora weighs about 1.5 kg (~3.5#)
- ~ 50-60% of fecal mass is bacterial biomass
- Microflora produces about 2 liters of gas daily
- Acquisition of resistance to antibiotics occurs in the intestine
- You can change the microbiome with: prebiotics
 antibiotics
 fecal transplant



Probiotics 8 facts you should know



Probiotics in our body outweigh our brain. The typical human brain weighs about 3 pounds, and a healthy human body will have over of probiotic bacteria and organisms.

Between 60 and 70 million

Americans are affected by digestive issues.

Americans invested more than **\$2** billion on digestive health supplements in 2014

D pounds

Our digestive system is home to different types of microorganisms. The majority of these contribute positively to human health and are called "probiotics".

out of

adults reported having a

digestive issue for which they purchased a product.

Up to of an individual's daily energy needs can be derived from the byproducts of the good bacteria in our gut.

There are 📲 🕛 入 more intestinal microorganisms than human cells in the body (10 trillion microorganisms vs. 10 billion human cells).







Different composition in different parts of the Body

There are ~ 2000 species 7000 strains









Influence of external factors on intestinal microbiota of infants Intrauterine contamination Familial environment (translocation) **Delivery Mode** Caesarean section Vaginal Bifidobacterium Clostridium Lactobacillus Staphyloccus Lactobacillus Corynebacterium Prevotella Enterococcus Propionibacterium Sneathia Time of weaning Gestational age and foods chosen First Weeks First months Adult-like microbiota Prenatal Birth Maternal microbes, Hospitalisation antibiotic use infection/ Treatments illness, diet and lifestyle Probiotics-Prebiotics Antibiotics Bifidobacterium Reduction in Type of Feeding Lactobacillus microbial Breastfeeding Formula feeding Genetics/ diversity Epigenetics Bifidobacterium Enterobacteriaceae (Collado et al 2012, Fouhy et al 2012, Margues et al 2010, Matamoros et al 2013) **Green- beneficial modification, red- modification considered negative for health

Typical Microflora of GI tract

Fewer organisms in the upper GI (aerobic) vs the lower GI (anaerobic)





Functions of the Microflora

- 1. Essential to normal anatomical and physiological development
- 2. Provides non-immunological protection against infection
- 3. Stimulates maturation and balancing of the immune system at birth and then regulates and primes the immune system throughout life
- 4. Facilitates a wide variety of metabolic functions to the host. These have profound implications on human health.
- 5. Also far more reaching effects including:
 - metabolic disease
 - mental health
 - CVD-various mechanisms







How the Modern Lifestyle Wreaks Havoc on the Microbiome



Exposure to harmful substances



Gut Instincts

Knot in my Stomach

My heart is in my throat

*bubbo-tubbo

Microbiota & the Gut-Brain Axis

- Germ Free Mice: Gut Microbiota affects
 - Anxiety
 - Learning and Memory
 - Mental Health and Mood
 - Appetite and Satiety
 - Autistic behavior
 - Neurological disorders such as MS, Parkinson's



- Germ free animals have increased turnover of anxiety related neurotransmitters such as noradrenaline, dopamine, and 5-hydroxtryptamine (5-HTP)
- Influences risk and symptomology of diseases modifying anxiety, mood, cognition, IBS and IBD



Anxiety and Depression in People with GI Diseases

- 1641 patients from GI practices
- 84.1% reported anxiety
- 67% trait anxiety
- 27% depression

Addolorato G, et al. 2008. Int J Clin Pract. July;62(7);1063-69



Psychiatric Co-morbidity with IBS

- IBS in 10-20% of US adults
- 70-90% of patients with IBS who seek treatment have psychiatric co-morbidity, mainly mood and anxiety disorders.
- 19% IBS in schizophrenia
- 29% IBS in major depression
- 46% IBS in panic disorder



Am J Ther. 2003 Jan-Feb;10(1):61-7

Leaky Gut = Leaky Brain

- Mental Disorder
- Mood swings
- Nervousness
- Aggressive behavior
- Fatigue/ malaise
- Poor memory
- Difficulty to focus

- Confusion
- Food sensitivities
- Environmental allergies
- Addictive behavior



Obese Vs. Lean Microbiota

- It was first demonstrated in mice research that the differences in gut microbiota could be a factor in obesity
- Obesity has been associated with reduced bacterial diversity and an altered representation of bacterial species
- Transfer of obese flora to lean produced obesity but the opposite not found
- More study will tell us more in the future



Typical problems

- Borborygmus rumbling noise caused by gas through intestines
- Bloating, gas
- GERD (heartburn)
- Constipation, diarrhea (SIBO, IBS)
- Peptic ulcers gastric and duodenal, caused by *Helicobacter pylori*, NSAIDS, HCI hypersecretion



Typical problems

- Cholecystitis inflammation of gall bladder
- Colitis inflammation of colon
- Dysphagia difficulty in swallowing
- Enteritis inflammation of the intestines
- Biliary calculi gall stones
- Hepatitis A, B, C, D, and E
- Cirrhosis scarred liver due to chronic inflammation



Evaluation of GI Concerns





"Routine" Blood Tests

- CBC
- Ferritin
- Chem screen
- Liver function tests
- Lipid Panel
- CRP
- Homocysteine
- Vitamin D3 (25-OH)

 These tests are not very specific for digestive problems and usually only provide a very cursory screening evaluation



Conventional Imaging











Specialized Tests







1. Complete Digestive **Stool Analysis** 2. Food Allergy Tests 3. Micronutrient testing 4. Heart rate Variability 5. Contact Regulation **Thermography (CRT)** 6. Zyto scan 7. BioResonance Testing





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VEAR OF BUILDING

Complete Digestive Stool Analysis



LAB N: F00000-0000-0 PATIENT: Sample Patient ID: P000000-000-0 SUX: Male DOD: 01/01/2001 AGE: 12

Comprehensive Stool Analysis / Parasitology x3

DICESTION ABSORPTION



Elastase findings can be used for the discnosis or the exclusion of exectine pancreatic insufficiency. Correlations between low levels and chronic pancreatitis and cancer have been reported. Fat Stain: Microscopic determination of focal 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. Eloating, flatulence, feelings of "fulness" 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.



Lysczyme* is an enzyme secreted at the site of inflammation in the GI tract and elevated levels have been identified in IBD patients. Lactoferrin is a quantitative GI specific marker of inflammation used to diagnose and differentiate IBD from IBS and to monitor patient inflammation toxels during active and remission phases of IBD. White Blood Cells (WBC): in the stool are an indication of an inflammatory process resulting in the infiltration of leukocytes within the intestinal lumen. WBCs are often accompanied by mucus and blood in the stool. Mucus in the stool may response to parasympathetic excitability such as spastic constipation or mucous colitis.

Within Outside Reference Range Secretary IgA*

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.

Complete Digestive Stool Analysis









Food Allergy Testing







US BloTek Standard Food Panel: IgA/IgG/IgE ADD Streins har larves Scenation at \$ \$1.00, UK Complete Report Assessor & Sample Report Assessor & Sample Report Collected ELN #: 200605331. D-05 Befort Laine during Completed: becelood; Jain States Dairy Fruits O F R REAVING M O F D DE V VI 0.0444 A605 NAME OF BRIDE ARCE Change, Swinger Sec. logic a General Internation 140 Owners. with the st COLUMN 1 200 Section. Your inere. President and Diam'r Meet/Ford Field. O F B B IV V M Perce. Distance in 144 Circles . in such BARNY. Particle, Name investory. For Firsts, Social 10110-0010-001 Lark Fish/Crustacea/Mollusk **bee** O F D DE V VI Sec. 1.047 Dei Misc 1044 0 E R DE M Y M Market. der. Course Inter Order Frank and in stars Server and Anney interhales TAURA CARA (III Sec. PLAN MERCY it she Party, Mandal V. 1410 Reaction Class Samanar ar No. Tel V VI

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Allergy Testing



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Deficient

Values in this area represent a deficiency and patient may require nutrient repletion or dietary changes Accession Number: J15360 Jana Doe







SpectraCell Micro-Nutrient Testing



HRV - A Stressed Nervous System is a Stressed Digestive System









The Heart Rate Variability (HRV)

- A quick electrophysiology <u>study</u> of the stress on your autonomic nervous system (ANS).
- Evaluates heart rate variability at rest and gives an assessment of the adaptability of the sympathetic and parasympathetic branches of the ANS.
- To achieve health and balance, the body needs to maintain a proper balance between the sympathetic, "fight or flight" and parasympathetic nerves "rest & digest" which is increasingly difficult due to the daily demands of the world.



Parasympathetic division

Sympathetic division











Contact Regulation Thermography



(CRI) Functional analysis of <u>15 major</u> organ systems in the body Helps detect indications of early disease processes or imbalances including:

- Identify blocked organ systems
- Evaluating lymphatic health
- Functionally looking at GI health
- Assesses ability to adapt to stress



Thermogram Report





ZYTO SCAN

http://livinganointed.net/ZYTO_Body_Scan.html

ZYTO technology uses quantum physics as well as frequency response technology to measure fluctuations in electrical output (energy) of your cells.









BioResonance testing





Basic Support for your Digestive System

- It is essential that your digestive system be ready to digest the food you are eating.
- Regular meals and NOT grazing is important to follow. Include the following:
- 1. Apple Cider vinegar $\frac{1}{2}$ -1 tsp in a glass of water 15 minutes before meals
- 2. Smell the food cooking
- 3. Think about the food you are about to eat
- 4. Chew extremely well (31 times for eat bite is preferred)
- 5. Put down your fork between each bite of food
- 6. Do not drink with meals, NEVER drink anything cold
- 7. Give thanks before eating.
- 8. Eat is a peaceful place, no outside distractions, no TV, play relaxing music if possible
- 9. After eating, sit and relax for 10-15 minutes



Organic Apple Cider Vinegar (ACV)







To start the DIGESTION Process

• An acidic solution produced by the fermentation of apples. **Organic Apple Cider Vinegar** contains pectin and the perfect balance of 19 minerals, including potassium, phosphorus, chlorine, sodium, magnesium, calcium, sulfur, iron, fluorine and silicon. The cider is made from apples and then turned into vinegar where acetic bacteria convert the alcohol in the cider to atic acid

 $\frac{1}{2}$ - 1 tsp of ACV in water 15 minutes before eati



Healthy Choices include



LOTS of Prebiotic and Probiotic

foods



Prebiotics



Prebiotic Rich Foods

- Jerusalem artichokes
- Onions
- Chicory
- Garlic
- Leeks
- Bananas
- Fruit
- Soybeans
- Burdock Root
- Asparagus

- Honey
- Maple syrup
- Chinese chives
- Peas
- Legumes
- Eggplant
- Green tea
- Yogurt
- Cottage cheese
- Kefir



Probiotic Rich Foods





Probiotic Rich Foods

- Yogurt/ Kefir
- Miso
- Natto
- Tempeh
- Sauerkraut
- Kim Chee
- Raw Pickles
- Anything fermented
- Root and Ginger beers
- Olives

- Honey
- Kombucha
- Fermented vegetables
- Buttermilk
- Raw Whey
- Raw vinegars
- Fermented sausages
- Sourdough
- Beer
- Wine





Eating Ten Portions Of Fruit And Vegetables Daily Can Prolong Life

 2/23/2017 A study published by the International Journal of Epidemiology suggests that "eating 10 portions of fruit and vegetables a day could significantly reduce the risk of heart attack, stroke, cancer and early death." Specifically, consuming about 800 grams of fruit and vegetables daily, twice the World Health Organization's current recommendation, "was associated with a 24% reduced risk of heart disease, a 33% reduced risk of stroke, a 28% reduced risk of cardiovascular disease, a 13% reduced risk of total cancer, and a 31% reduction in dying prematurely," compared to not eating fruits and vegetables at all







Gluten-free

What is the BEST diet For YOU?















ESSENTIAL SUPPLEMENTS FOR GI health FOR THE ENTIRE FAMILY







Kids10-20 billionAdults25-50 billionGI issues100-250billion500 billion

An ABSOLUTE must for EVERYONE









PGE1

PGI3

HEALTH BENEFITS OF MINERALS Organic Sector



Iron- Aids in formation of hemoglobin and prevents anemia

Magnesium- Treats high blood pressure, lowers anxiety and stress

Phosphorous- Reduces muscle weakness and corrects sexual weakness

Zinc- Manages skin care, eczema, acne, heals wound and nights blindness

Calcium- Boosts bone health, relieves insomnia and improves dental health









