# HELP ME EAT BETTER!

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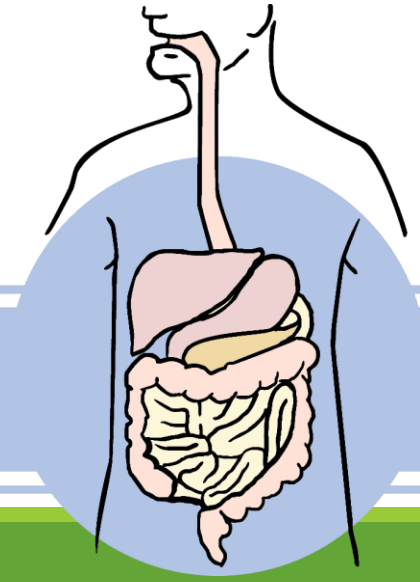
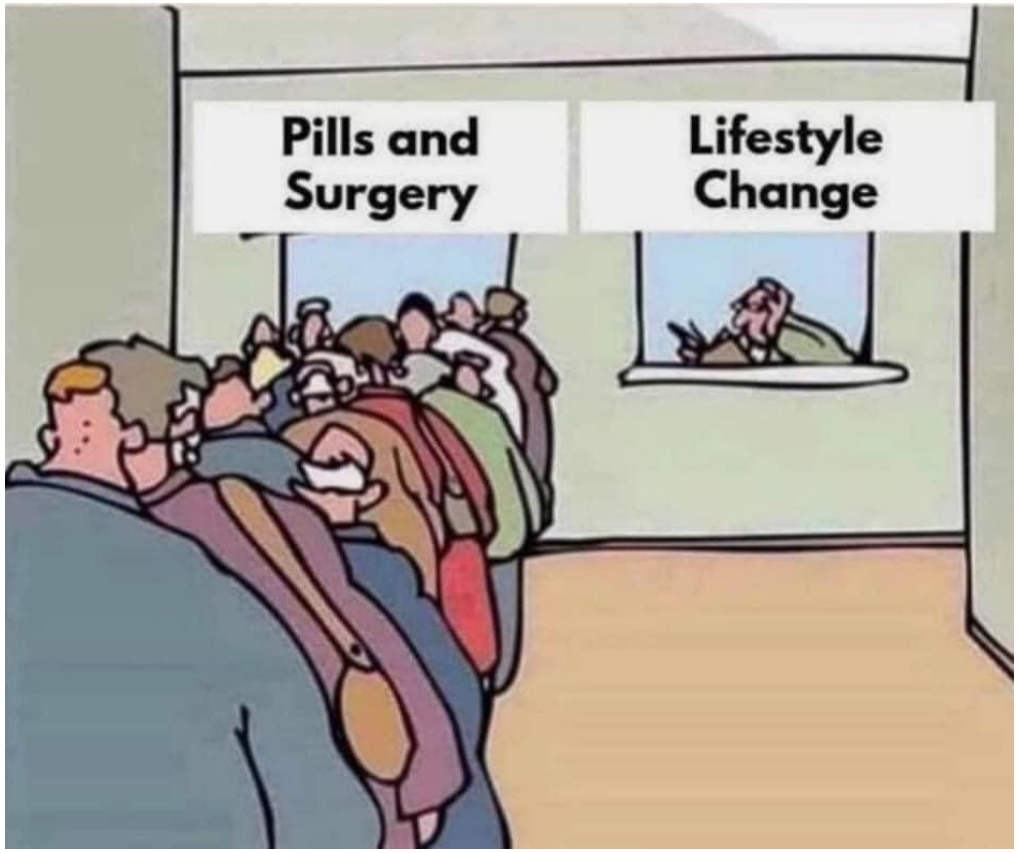


Digestive and Liver Center of Florida

# PHILOPSOPHY OF PRACTICE

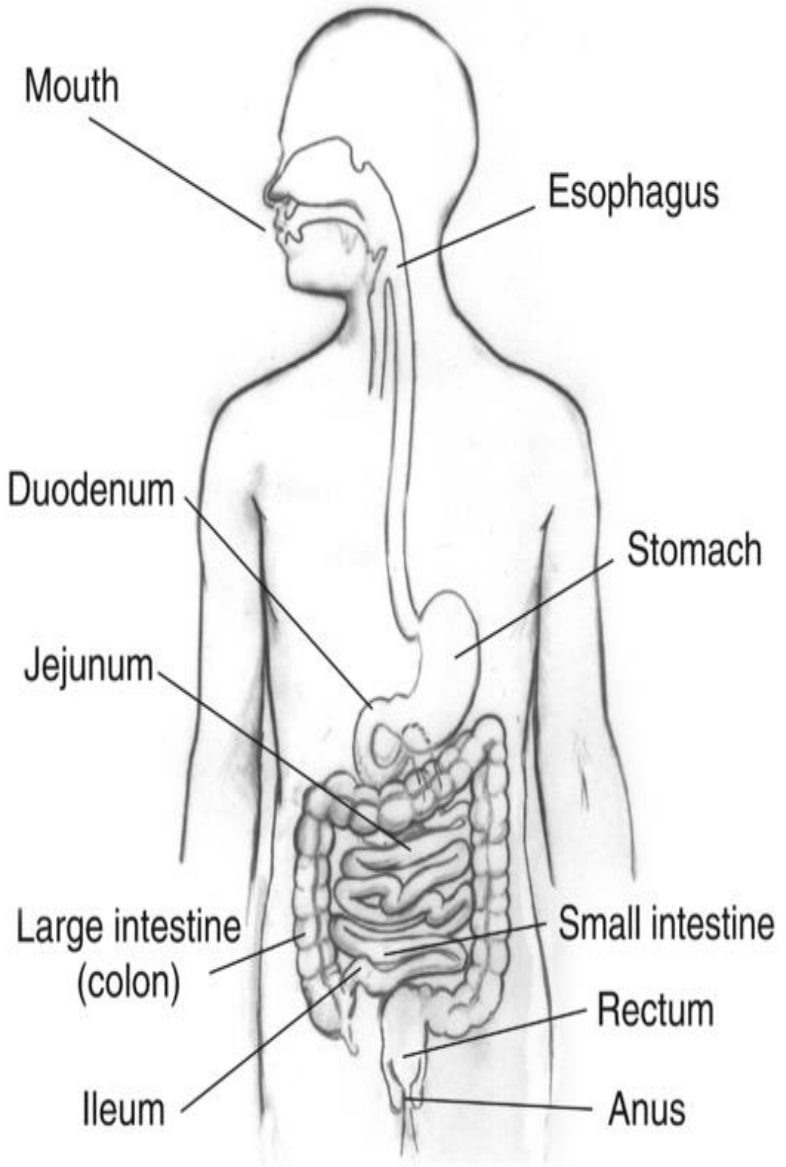
1. SLEEP AND THE CIRCADIAN RHYTHM
2. CLEAN AIR, WATER, FOOD – MINIMIZE POLLUTION
3. ***A HEALTHY GASTROINTESTINAL SYSTEM***
4. FITNESS/EXERCISE KEEPS A BODY STRONG
5. STRESS MANAGEMENT/MEDITATION/YOGA/BREATHING
6. STRENGTH IN  PERSONAL RELATIONSHIPS AND POSITIVE EMOTIONS
7. BACK TO NATURE/GO OUTSIDE AND PLAY

# THIS SAYS IT ALL



# OUR DISCUSSION TODAY WILL FOCUS ON THESE TOPICS

- **Overview of the Microbiome including**
  - BRAIN,EAR, SKIN, NOSE, RESPIRATORY, URINARY, VAGINAL TRACT, BLOOD STREAM, AND GI TRACT. Their genes are now thought to contribute more to human survival than the genes.
- **MOUTH**
- **ESOPHAGUS**
- **COLON SMALL AND LARGE INTESTINE**
- **Q & A - BEST TO HOLD TO THE END, PLEASE**



# TENETS OF ALL DISEASE

1.INFLAMATION AFFECTS THE

IMMUNITY

2. DISRUPTNION [DYSBIOSIS] OF MICROBIOME ONE CAUSE OF INFLAMMATION

# THE GUT-BRAIN MICROBIOME AXIS AND ITS LINK TO AUTISM: EMERGING INSIGHTS

2021 emerging research, GI symptoms are also correlated with more pronounced irritability, social withdrawal, stereotypy, hyperactivity, and sleep disturbances, suggesting that they may exacerbate the defining behavioral symptoms of ASD.

Despite these facts (and to the detriment of the community), GI distress remains largely unaddressed by ASD research and is frequently regarded as a symptomatic outcome rather than a potential contributory factor to the behavioral symptoms.

Front Cell Dev Biol . 2021 Apr 15;9:662916. doi: 10.3389/fcell.2021.662916. eCollection 2021.**The Gut-Brain-Microbiome Axis and Its Link to Autism: Emerging Insights and the Potential of Zebrafish Models.** David M James [1], Elizabeth A Davidson [1], Julio Yanes [1], Baharak Moshiree [2], Julia E Dallman [1]
PMID: 33937265 PMCID: PMC8081961 DOI: 10.3389/fcell.2021.662916

# Hetil 2016, PHYSIOLOGICAL PATTERNS IN INTESTINAL MICROBIOTA: OBESITY, INSULIN RESISTANCE, DIABETES, METABOLIC SYNDROME

Composition of the intestinal microbiota is affected by the circadian rhythm, such as in shift workers.

Disruption of circadian rhythm may influence intestinal microbiota.

The imbalance between the microbiota and host organism leads to dysbacteriosis. From the membrane of Gram-negative bacteria lipopolysaccharides penetrate into the blood stream, via impaired permeability of the intestinal mucosa.

These processes induce metabolic endotoxemia, inflammation, impaired glucose metabolism, insulin resistance, obesity, and contribute to the development of metabolic syndrome, type 2 diabetes, inflammatory bowel diseases, autoimmunity and carcinogenesis.

Encouraging therapeutic possibility is to restore the normal microbiota either using pro- or prebiotics, fecal transplantation or bariatric surgery.

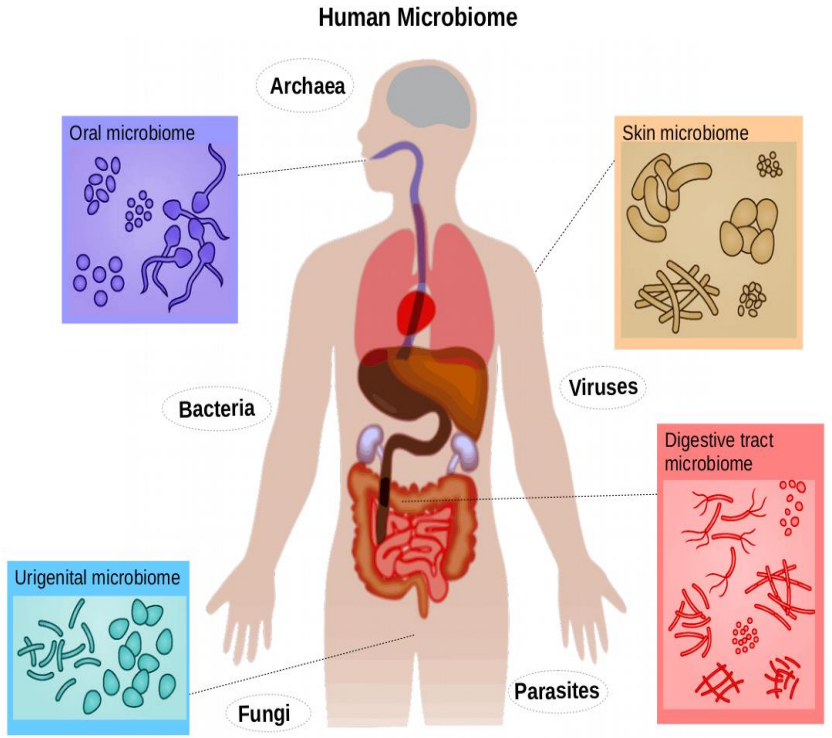
Orv Hetil . 2016 Jan 3;157(1):13-22. doi: 10.1556/650.2015.30296. **[Physiological patterns of intestinal microbiota. The role of dysbacteriosis in obesity, insulin resistance, diabetes and metabolic syndrome]** [Article in Hu] Tamás Halmos [1], Ilona Suba [2] Affiliations expand PMID: 26708682 DOI: 10.1556/650.2015.30296

# Human Microbiome Project the ratio of bacterial protein-coding genes to human genes is 360:1

The human microbiome is pivotal to the process of-

1. aging,
2. digestion,
3. immune system,
4. modulation of the central nervous system
5. and a person's mood and cognitive ability.

This makes the human microbiome an essential organ in the human body. Without it the human body cannot function.




https://www.whatisbiotechnology.org/index.php/science/summary/microbiome/the-human-microbiome-refers-to-the-complete-set-of-genes

# HUMBLE BEGINNINGS OF OUR MICROBIOME

Three billion years ago

Air was hydrogen sulfide

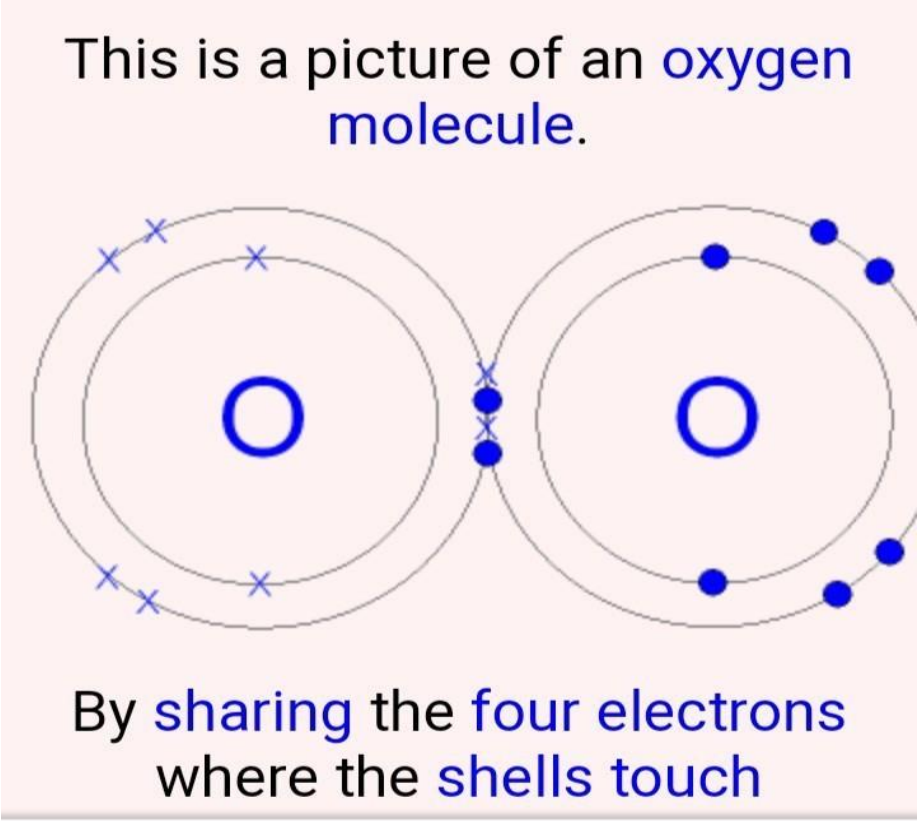
Single cells organisms lived in a world without oxygen

# BEGINNINGS OF OUR MICROBIOME

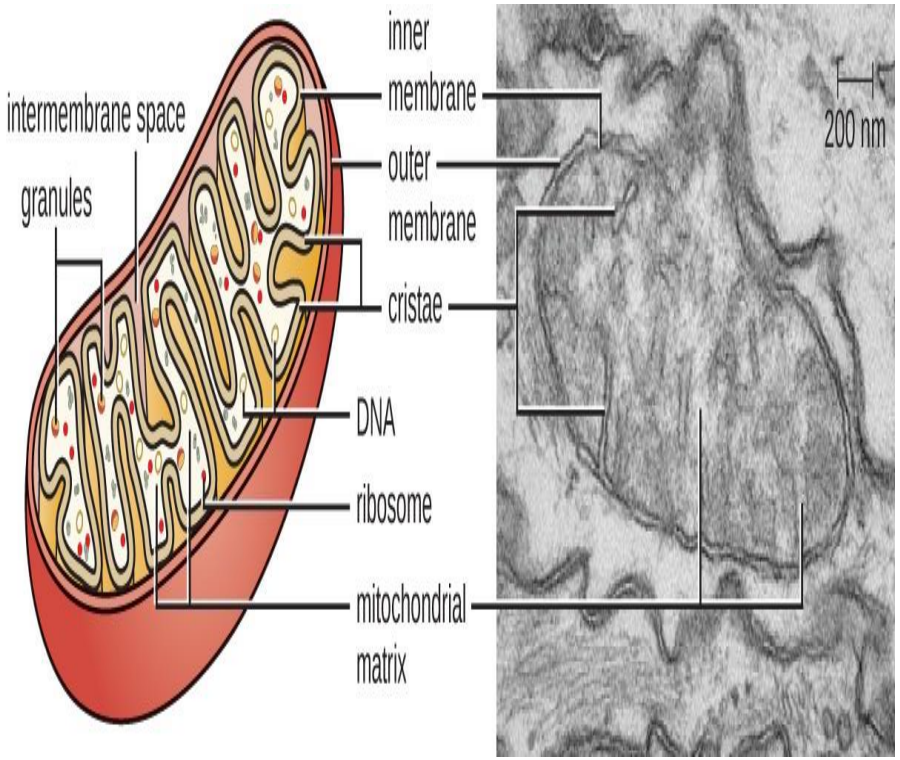
Eventually oxygen surpasses hydrogen sulfide.

Single cell organisms [prokaryotes] adapt.

Adaptive strategies to survive in this new world rich in oxygen.



# TO SURVIVE WE MUST PROTECT OUR MICROBIOME

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Complex Mitochondrial evolution occurred when primitive cells captured bacteria that evolved into the mitochondria and became the powerhouse of each cell

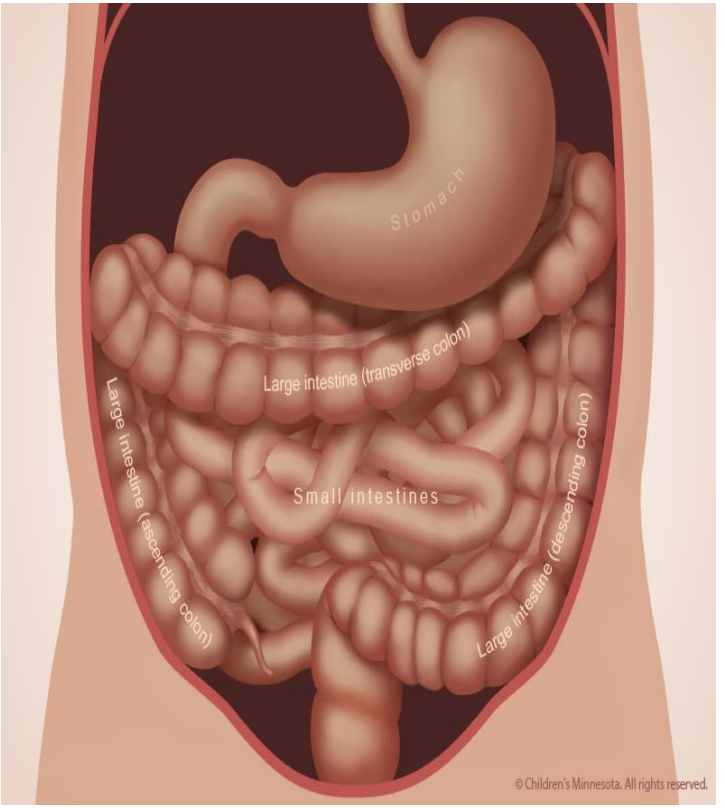
This evolutionary process eventually resulted in complex human beings

http://bioscience.jbpub.com/cells/MBIO1322.aspx#:~:text=Mitochondria%20originated%20by%20a%20endosymbiotic,captured%20by%20a%20eukaryotic%20cell.&text=Figure%203.41%20shows%20the%20endosymbiosis,evolved%20into%20mitochondria%20and%20chloroplasts.

# INTERACTION BETWEEN GUT MICROBIOME AND MUCOSAL IMMUNE SYSTEM

Gut microbiota, the largest ecosystem w host, maintains host intestinal homeostasis

Commensal [good] microbiome regulates mucosal immune system and pathogenic microbiome causes immunity dysfunction and disease development




**Interaction between the gut microbiome and mucosal immune system** Na Shi [# 1], Na Li [# 2], Xinwang Duan [2], Haitao Niu [1]
PMID: 28465831 PMCID: PMC5408367 DOI: 10.1186/s40779-017-0122-9 **Free PMC article**

# MATERNAL FATTY ACID INTAKE CAUSES LONG LASTING IMPACT ON GUT MICROBIOME AND OBESITY

"The early-life gut microbiota plays a critical role in host metabolism in later life. **Conclusions**

Our data provide novel evidence that weight gain and metabolic dysfunction in adulthood is mediated by maternal fatty acid status through long-lasting restructuring of the gut microbiota. These results have important implications for understanding the interaction between modern Western diets, metabolic health, and the intestinal microbiome."

Microbiome. 2018; 6: 95.Published online 2018 May 24. doi: 10.1186/s40168-018-0476-6. MCID: PMC5968592
PMID: 29793531 **Maternal omega-3 fatty acids regulate offspring obesity through persistent modulation of gut microbiota**
Ruairi C. Robertson,[1,2,3] Kanakaraju Kaliannan,[1] Conall R. Strain,[2,3] R. Paul Ross,[3] Catherine Stanton,[2,3] and Jing X. Kang

# GASTROINTESTINAL HEALTH STARTS AT BIRTH

# NEONATE IS STERILE IN THE WOMB

Neonatal womb is sterile -------→ Delivery, maternal microflora +Environmental microbes

Living in a home that is clean but not sterile

Colonization starts ----------and fills the Gut environment

Infant is unstable time w low gut diversity----------

Diet + Environmental microbes The Gut organisms mature

That with Host genetics + Host immunity

Results in High diversity and Resistance to Pathogens

# MATURING MICROBIOME OF THE INFANT

**Insults to Microbiome** ----Infection vs Malnutrition vs Antibiotics

**Transient Dysbiosis** ------ Partial Recovery vs Full Recovery

**Persistent Dysbiosis w low Diversity**---A gut Vulnerable to Pathogens

**Healthy Mature Gut = High Diversity and Resistant Pathogens**

# NORMAL GASTROINTESTINAL BACTERIA

MEGASPHAERA
PREVOTELLA
COLLINSELLA
SLAKIA
BIFODBACTERIUM
FUSOBACTERIUM
SHIGELLA
ANAEROBIOSPIRILLUM

VEILLONELLA
BACTEROIDES
OLSENELLA
EGGERTHELLA
FUSOBACERIUM
ESCHERICHIA
SUCCINIVBRIO

CLOSTRIDIUM
FAECALIBACTERBUM
LACTOBACILLUS
ENTEROCOCCUS
CATENBACTERIUM
ALLOBACULUM
DIALISTER

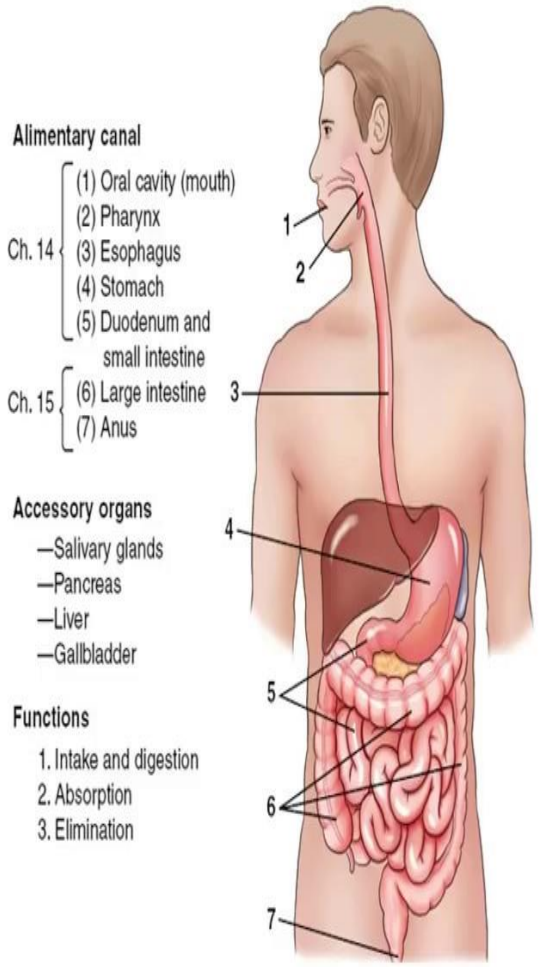
RUMINOCOCCUS
EUBACTERIUM
STREPOCOCCUS
TURICBACTER
COPOBACILLUS
MEGAMONAS

# THE MICROBIOME HAS A GREATER EFFECT THAN OUR GENES ON THE IMMUNE SYSTEM

BIODIVERSITY DIGESTIVE MICROBIOME

EQUAL PROTECTION FROM PATHOGENS

# Anatomy: Alimentary Canal




1. MOUTH
2. ESOPHAGUS
3. SMALL INTESTINE
4. LARGE INTESTINE

# ORAL MUCOSA HAS A PROTECTIVE BARRIER

THE ORAL MUCOSA IS PRIMARY BARRIER SITE AND PORTAL O FENTFY OF MICROBES, FOOD, & AIRBORN PARTICLES OF GI TRACT AND IS JUST BEGINNING TO BE UNDERSTOOD.

THE IMPORTANCE OF PROTECTIVE IMMUNITY RESPONSE OF INTERLEUKIN-17HELPER CELLS HELP MAINTAIN A BARRIER INTEGRITY FROM BAD BACTERIA, FUNGUS

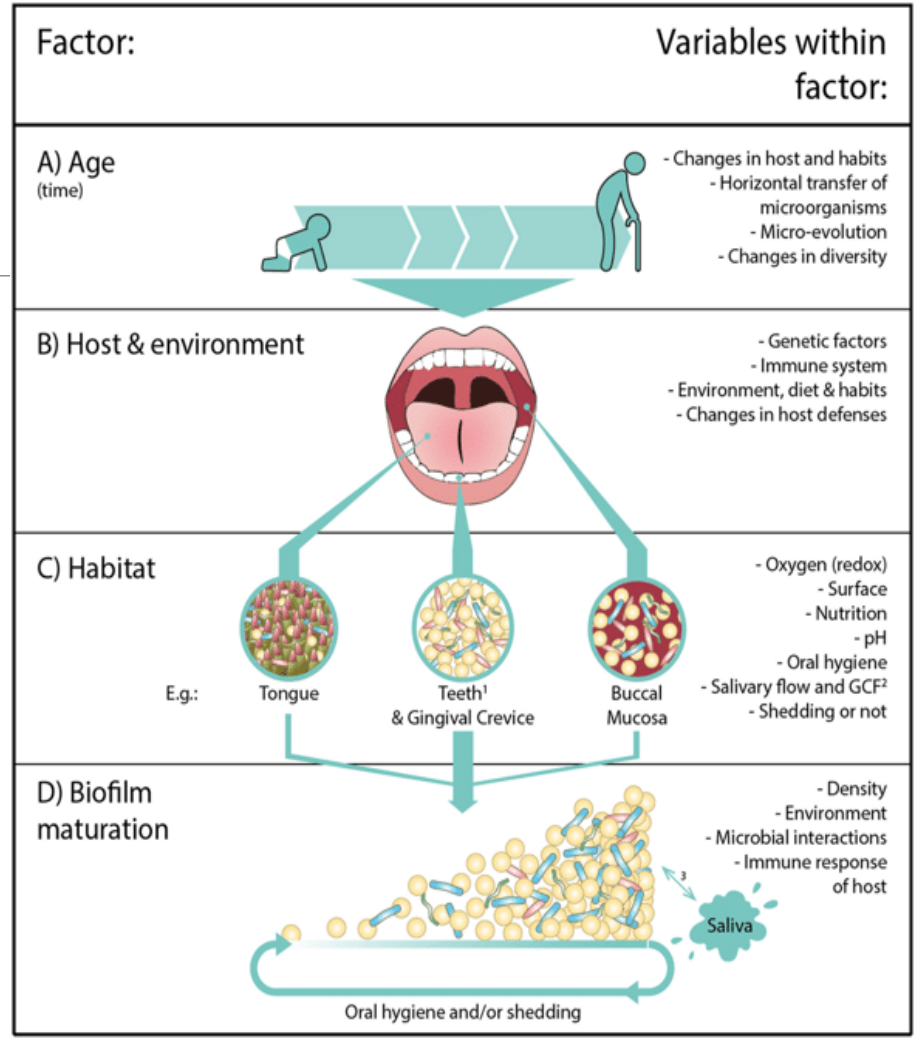
# THERE IS A DELICATE BALANCE BETWEEN ORAL MUCOSA AND THE MICROBIOME PREVENTING CANDIDA AND PERIODONTAL DISEASE

**Regulation of host-microbe interactions at oral mucosal barriers by type 17 immunity.** Sarah L Gaffen[1], Niki M Moutsopoulos[2] PMID: 31901072
•PMCID: PMC7068849 DOI: 10.1126/sciimmunol.aau4594

# ORAL MUCOSA HEALTH IMMUNITY & DISEASE

Changes in host [age] & habit-

1. Microevolution and changes in diversity
2. Genetic factors
3. Immune system
4. Diet
5. Habitat of tongue, Teeth, Gingival Crevice, Buccal Mucosa
6. Biofilm maturation with oral hygiene resulting in density, microbial interactions, immune response of host



# ABNORMAL ORAL MICROBIOTA & PERIODONTAL DISEASE

- MICROBIOTA-**colon cancer, infectious endocarditis, ventilator-associated pneumonia and Alzheimer's disease.**

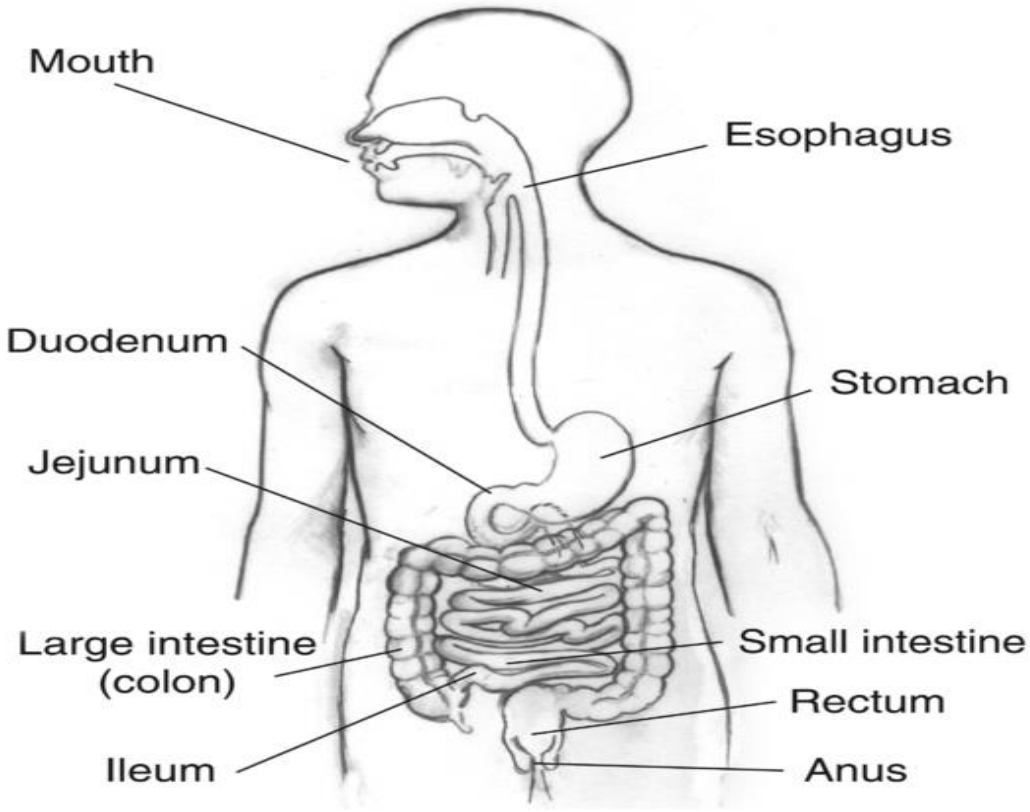
PERIDONTITIS- systemic conditions such as **cardiovascular disease, diabetes, pregnancy complications and rheumatoid arthritis.**

DOI 10.1126/sciimmunol.aau4594

# ESOPHAGEAL MICROBIOTA

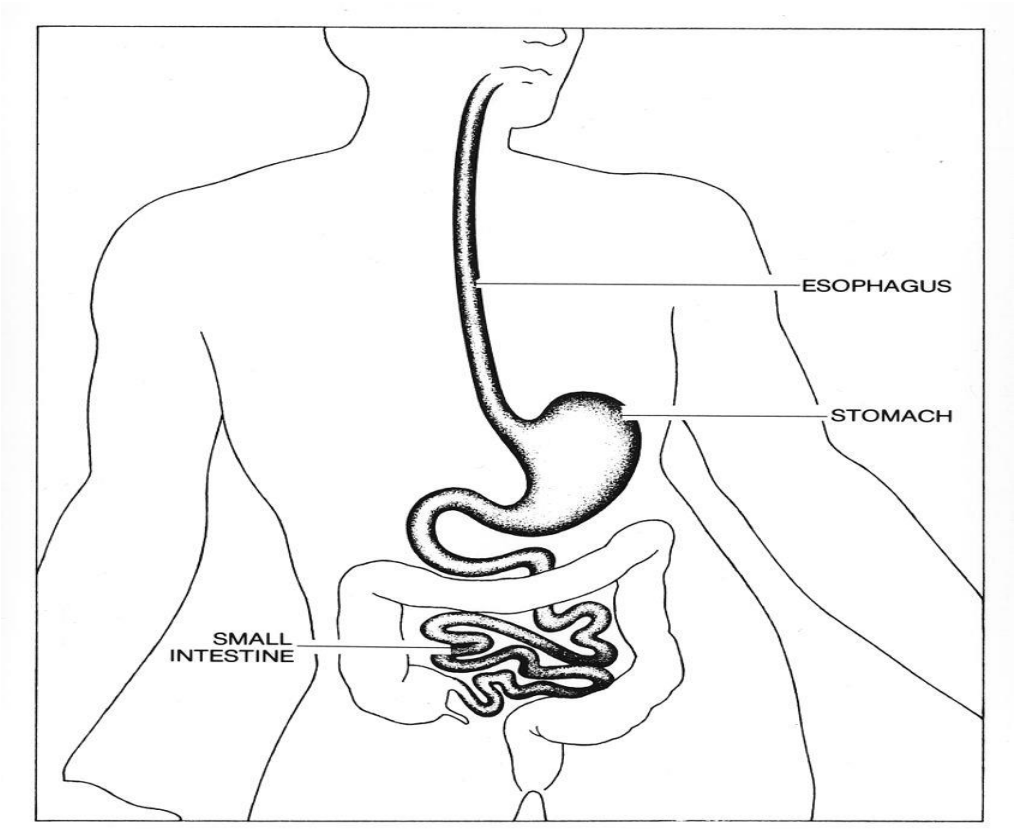
We have identified,

Six major phyla constitute the esophageal microbiota, including ***Firmicutes, Bacteroides, Actinobacteria, Proteobacteria, Fusobacteria and TM7,*** similar to the oral microbiota.



# ESOPHAGEAL MICROBIOME DYSBIOSIS, NOT WELL UNDERSTOOD

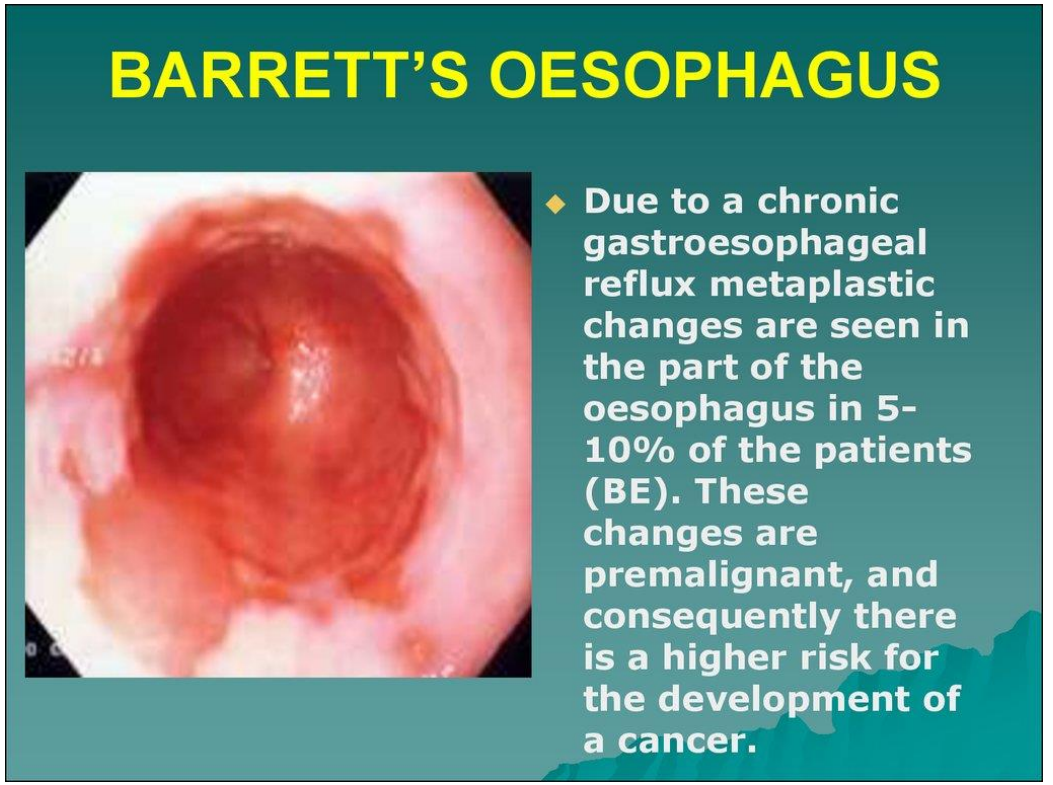
1. NORMAL ESOPHAGUS DIVERSITY W *MOSTLY GRAM-POSITIVE* ORGANISMS
2. GRAM NEGATIVE BACTERIA PREVAIL IN REFLUX DISEASE OF GERD AND BARRETTS ESOPHAGUS
3. THE MICROBIOME IS ALSO ALTERED IN ESOINOPHIL ESOPHAGITIS AND DYSMOTILITY DISORDERS



# ESOPHAGEAL ADNEOCARCINOMA MORE COMMON LAST SEVERAL DECADES

BARRETTS ESOPHAGUS RISK FACTOR: GERD, MALE SEX, OLDER AGE, CENTRAL OBESITY, TOBACCO ABUSE, HELCOBACTER PYLORI, PROTON PUMP INHIBITORS AND ANTIBIOTIC THERAPY.5 year survival is 20%.

## CAN FUTURE KNOWLEDGE ABOUT OUR MICROBIOME CHANGE RISK OF ESOHAGEAL CANCER?



# STOMACH

In clinical practice you have abdominal pain. It seems to be in the upper abdomen but not always.

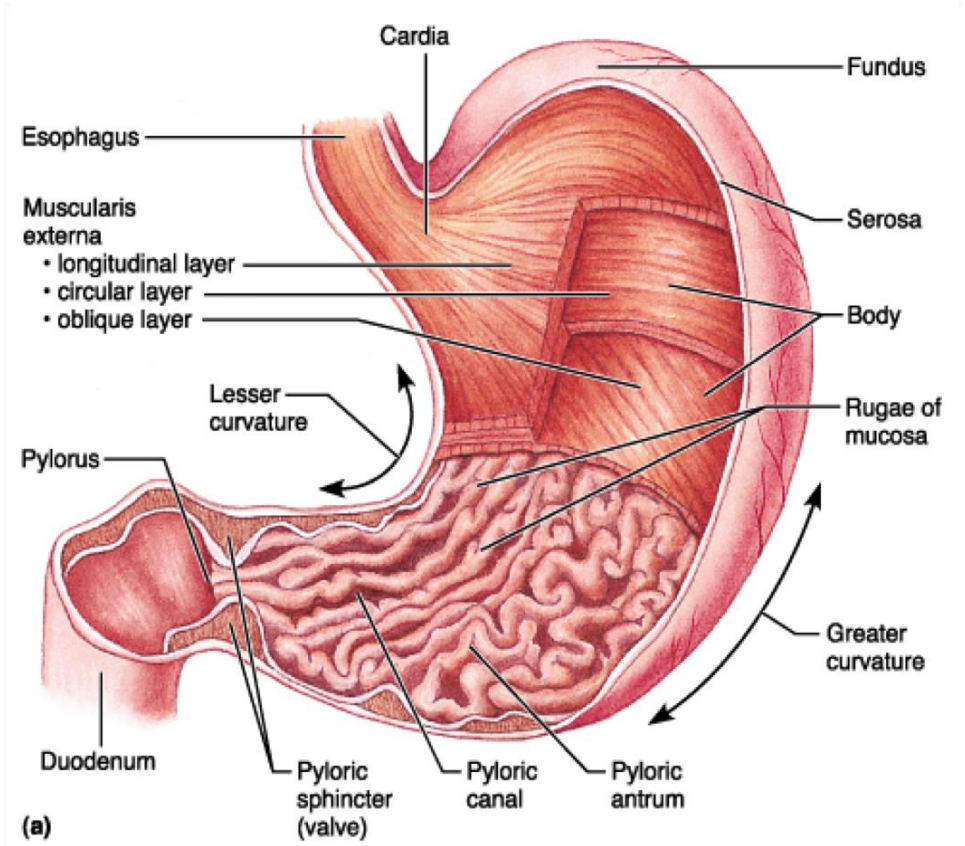
You have been coughing and the ENT tells you that you have silent reflux.

You get the EGD and are told you have gastritis and ulcers and to avoid certain foods:

1. Tomato's and other spicy foods
2. Acidy fruits like pineapple and citrus
3. Garlic and onions
4. High fat foods since that can delay stomach emptying time and make reflux worse; avoid spicy foods
5. Alcohol, coffee, tea, carbonated beverages

But you are no better and don't even feel the reflux and yet there it is on endoscopy

# STOMACH DYSBIOSIS AND DISEASE




1. Helicobacter pylori [HP] gastritis and Clostridioides difficile infection [CDI]more frequent if less Roseburia and Enterobacter microbes in stomach
2. Genus *Enterobacter* is dominant in HP-free patients

***Helicobacter pylori*** **infection alters gastric and tongue coating microbial communities** Yubin Zhao Xuefeng Gao Jiaxuan Guo Dongbao Yu Ying Xiao Huijie Wang

Yuchan Li First published: 07 February 2019 **https://doi.org/10.1111/hel.12567**

# SMALL STUDY OF H PYLORI TREATMENT VS USING PROBIOTICS ALONE

n=70 Efficacy of *H. pylori* eradication treatment

Group A received 14 days hpylori treatment and improved including abdominal distention, feeling of incomplete evacuation, eructation, acid regurgitation and heartburn in group

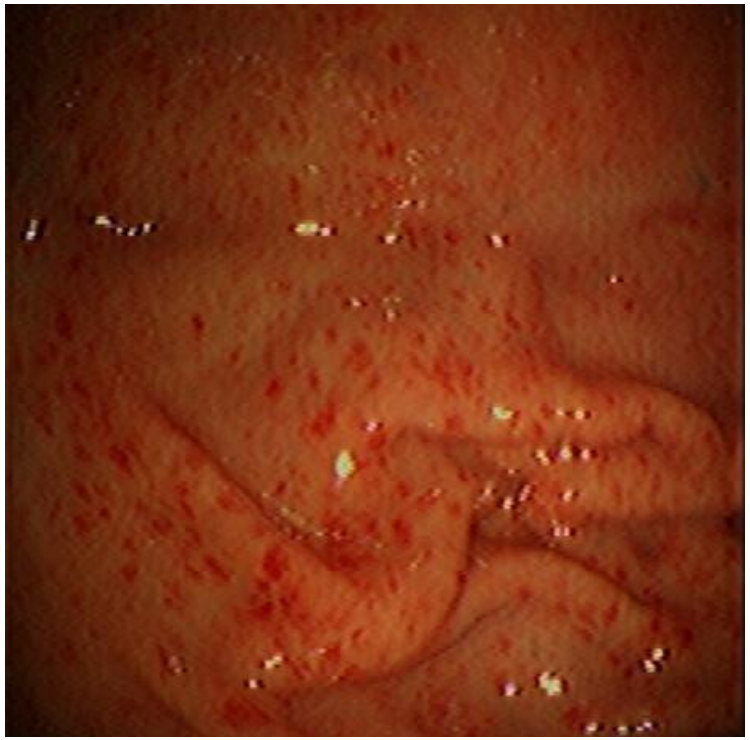
Group B probiotic treated group improvement in additional symptoms of deficatroy function.

Neither group had side effects.

***Helicobacter pylori* infection alters gastric and tongue coating microbial communities** Yubin Zhao Xuefeng Gao Jiaxuan Guo Dongbao Yu Ying Xiao Huijie Wang Yuchan Li First published: 07 February 2019 **https://doi.org/10.1111/hel.12567**

# HELICOBACTER PYLORI

1. While *H. pylori* infection may not be necessarily detrimental in all patients, eradication of *H. pylori* was associated with widespread changes in gut microbial ecology and structure.
2. Probiotic supplementation could relieve more gastrointestinal symptoms by inducing alterations in gut microbiota and host immune responses.
3. As such, the decision to eradicate *H. pylori* should be based on comprehensive analysis of individual patients.
4. Probiotic supplementation was associated with improved gastrointestinal symptoms as well as increased *Bacteroidetes*:Firmicutes ratio.



***Helicobacter pylori* infection alters gastric and tongue coating microbial communities** Yubin Zhao Xuefeng Gao Jiaxuan Guo Dongbao Yu Ying Xiao Huijie Wang Yuchan Li First published: 07 February 2019 **https://doi.org/10.1111/hel.12567**

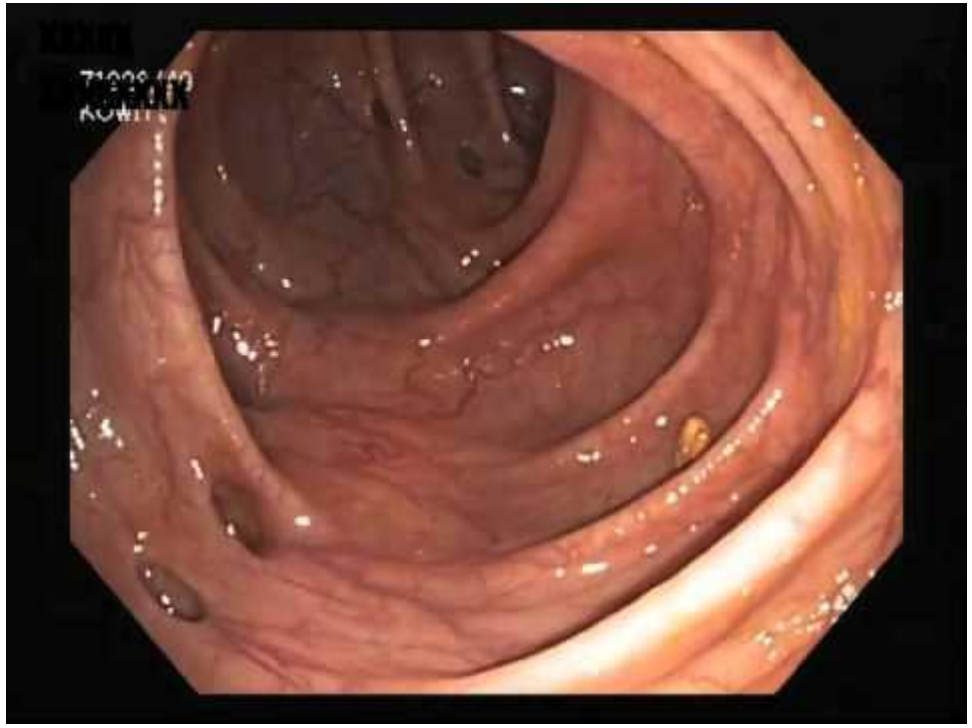
# INTESTINE

In clinical practice symptoms often are bloating after eating, indigestion, constipation or diarrhea or both,  in spite of the usual diet changes, over the counter aids, and prescription medications.

Your life revolves around, where is the next bathroom.

Objectively with upper and lower endoscopy, we find nothing obvious except some diverticulosis and maybe hemorrhoids.

The patient is offered Benefiber or Metamucil and diet changes, once a gain you are no better.



# COLON CANCER

Colorectal cancer (CRC) is the third most prevalent form of cancer, after lung cancer and breast cancer, with the second highest death incidence

Front Pharmacol. 2019 Mar 5;10:152. doi: 10.3389/fphar.2019.00152. eCollection 2019.

**Curcumin Nanoformulations for Colorectal Cancer: A Review.**

Wong KE[1,2], Ngai SC[3], Chan KG[4,5], Lee LH[1,2,6], Goh BH[1,2,6], Chuah LH[1,2,7].

**Author information**

1. COLORECTAL CANCER DOESN'T HAVE A SINGLE CAUSE BUT RATHER THERE ARE ALTERATIONS INSIDE OF THE MOLECULE

2. CRC IS INFLUENCEC BY DIET, ENVIROMENTAL AND MICROBIAL EXPOSURES AND HOST IMMUNITY

3. THE MAJORITY OF COLORECTAL CANCERS ARE SPORADIC, NOT GENETIC

4. THE FACT IS WHAT A PERSON EATS HAS A PROFOUND EFFECT ON THE INITIATION, PROMOTION AND PROGRESSION OF NEOPLASTIC PROCESS.

5. THE RATE OF CARCINOGENESIS IS DERTEMINED BY THE PENETRANCE OF THE GENETIC DEFECT AND BY THE AGGRESSIVENESS OF ENVIRONMENTAL INSULT

# SMALL INTESTINAL MICROBIOTA DYSFUNCTION

Microbes from the genera *Blautia*, *Roseburia*, and *Flavonifractor* assist in the clinical classification and prognosis assessment of intestinal diseases, including Irritable Bowel Syndrome [IBS], Inflammatory Bowel Disease [IBD], and colorectal cancer (CRC).

The genera *Blautia* and *Flavonifractor* contribute to discrimination of **IBS or CRC** from controls.

Also, the ***abundance of Roseburia increases significantly after 1-week administration of vitamin D in Crohn's disease (CD) cases***.

The decreased abundance of *Roseburia* and *Blautia* in feces specimens of patients with **ulcerative colitis (UC)** indicates a higher risk of pouchitis after ileal–anal pull-through surgery. In particular, patients with **IBD or CDI** have lower levels of *Blautia* than those without CDI.

***Also, the genus Blautia is enriched after 26 weeks of quadruple treatment with bismuth in patients with asymptomatic HP-related gastritis.***

Front Bioeng Biotechnol. 2020; 8: 299.Published online 2020 May 13. doi: 10.3389/fbioe.2020.00299 PMCID: PMC7237573 PMID: 32478040**Rewiring of Microbiota Networks in Erosive Inflammation of the Stomach and Small Bowel** Xiao-Yu Chen,[1,†] Hui-Ning Fan,[1,†] Huang-Kai Zhang,[2] Huang-Wen Qin,[1] Li Shen,[3] Xiang-Tian Yu,[3,*] Jing Zhang,[1,*] and Jin-Shui Zhu[1]

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# EMERGING KNOWLEDGE OF MICROBIOTA & DISEASE

In addition, E. cloacae is associated significantly with CD patients without antibodies to Saccharomyces cerevisiae.

Also, many microbes are associated with the immune response and therapeutic results in gut inflammation.

For example, oral administration of *Citrobacter koseri* JCM1658 aggravates systemic allergic reactions and reduced numbers of intestinal T-helper-17 cells.

Second, for the key microbiota with differential abundance identified by iENA, some were indeed candidate pathogenic microbes, though they did not have significantly different abundances.

Front Bioeng Biotechnol. 2020; 8: 299.Published online 2020 May 13. doi: 10.3389/fbioe.2020.00299 PMCID: PMC7237573
PMID: 32478040 **Rewiring of Microbiota Networks in Erosive Inflammation of the Stomach and Small Bowel** Xiao-Yu Chen,[1,†] Hui-Ning Fan,[1,†] Huang-Kai Zhang,[2] Huang-Wen Qin,[1] Li Shen,[3] Xiang-Tian Yu,[3,*] Jing Zhang,[1,*] and Jin-Shui Zhu[1,*]

# IS LEAKY GUT REAL?

- Leaky gut: mechanisms, measurement and clinical implications in humans
- PMID: 31076401
- Publication Type: Review
- Publication Date: 2019-08-01
- Journal: Gut
- Author(s): Michael Camilleri
- Abstract: The objectives of this review on 'leaky gut' for clinicians are to discuss the components of the intestinal barrier, the diverse measurements of intestinal permeability, their perturbation in non-inflammatory 'stressed states' and the impact of treatment with dietary factors. Information on 'healthy' or 'leaky' gut in the public domain requires confirmation before endorsing dietary exclusions, replacement with non-irritating foods (such as fermented foods) or use of supplements to repair the damage. The intestinal barrier includes surface mucus, epithelial layer and immune defences. Epithelial permeability results from increased paracellular transport, apoptosis or transcellular permeability. Barrier function can be tested in vivo using orally administered probe molecules or in vitro using mucosal biopsies from humans, exposing the colonic mucosa from rats or mice or cell layers to extracts of colonic mucosa or stool from human patients. Assessment of intestinal barrier requires measurements beyond the epithelial layer. 'Stress' disorders such as endurance exercise, non-steroidal anti-inflammatory drugs administration, pregnancy and surfactants (such as bile acids and dietary factors such as emulsifiers) increase permeability. Dietary factors can reverse intestinal leakiness and mucosal damage in the 'stress' disorders. Whereas inflammatory or ulcerating intestinal diseases result in leaky gut, no such disease can be cured by simply normalising intestinal barrier function. It is still unproven that restoring barrier function can ameliorate clinical manifestations in GI or systemic diseases. Clinicians should be aware of the potential of barrier dysfunction in GI diseases and of the barrier as a target for future therapy.

# SMALL INTESTINAL BACTERIAL OVERGROWTH

Irritable bowel disease once thought to be psychogenic

Now we know multifactorial

Acceptance of gut dysbiosis, SIBO

Quantitative jejunal aspirate culture is gold standard of SIBO

Noninvasive hydrogen breath tests popular, w low sensitivity, so not a perfect test

More common in females, older, diarrhea-predominant IBS, bloating, flatulence, use of PPI and narcotics, low hemoglobin more associated to SIBO vs IBS

Some get better w antibiotics [Rifaximin] and others with probiotics, so can't all be somatic.

•. 2017 Mar 15;11(2):196-208. doi: 10.5009/gnl16126.**Small Intestinal Bacterial Overgrowth and Irritable Bowel Syndrome: A Bridge between Functional Organic Dichotomy**
Uday C Ghoshal[1], Ratnakar Shukla[1], Ujjala Ghoshal[1]Affiliations PMID: 28274108 PMCID: PMC5347643 DOI: 10.5009/gnl16126

# IT IS INEVITABLE THAT THE MICROBIOBE WILL BE DISRUPTED IN YOUR LIFE TIME

## So how do you fix your GI tract?

1. Go to a gastroenterologist and get worked up, yes it often requires several tests
2. Think of the microbiome
3. Revaluate your diet
4. Evaluate your stress, there is a gut-brain connection
5. Consider probiotics and prebiotics

# THE HISTORY OF PROBIOTICS

We have been eating microbes for centuries. Did you know that?

1907 Nobel Prize to E Metchnikoff, describing beneficial microbes to replace harmful microbes and pathogens in human gut.

1960 Lilly and Stillwell suggested probiotics as substances produced by microorganism that promote the growth of other microbes.

1989 Fuller defined priobiotic as a live microbial feed supplement that benefits host animal by  improving intestinal balance.

1992 Havenaar and Huis in't Veld defines a probiotic as viable mono or mixed culture bacteria that improves indigenous flora.

**2002 FAO/WHO guidelines defined probiotics as "live microorganisms which when administered in adequate amount confer a health benefit on the host."**

Today, the question of successful fecal transplants is likely to further redefine the concept and future of probiotics as mixed cultures of microorganisms.

Probiotics H. Kumar, S. Salminen, in Encyclopedia of Food and Health, 2016

# WHAT ARE PROBIOTICS?

Probiotics are live microorganisms that function like good bacteria in the gut.

Ingesting foods that contain them or taking probiotic supplements can help repopulate the beneficial bacteria, overwhelming the bad bacteria.

/www.benefiber.com/

# WHAT ARE PREBIOTICS? I ALWAYS SUGGEST, START HERE

Prebiotics are carbohydrates that act as food for beneficial bacteria in the gut. **It's recommended that you eat 21 to 38 grams of fiber [carbohydrate]**

These carbs travel undigested to the colon, where they ferment and produce small chain fatty acids that feed the gut flora.[5] Not all plant foods function in this way, but those containing specific types of soluble fiber—including wheat dextrin—do.[5]

**Prebiotics are found in:** onions, garlic, leeks, soybeans, chicory root, honey, banana, Jerusalem artichoke,and **Benefiber**. www.benefiber.com

# WHY SUPPLEMENT?


## WHY WE MIGHT NEED TO SUPPLEMENT

1. Too little dietary fiber
2. City Pollution- airborne particles enter our bodies and damage the microbiome, air we breathe, food we eat
3. Antibiotics especially broad vs narrow spectrum – kill bacteria indiscriminately altering the microbiome balance taking several years to recover
4. Stress reduces gut flora diversity and increasing imbalance of unhealthy bacteria

# PROBIOTICS

**Probiotics are found in:** yogurt, kefir, cottage cheese, cheddar cheese, sauerkraut, kombucha, pickled vegetables, kimchi, miso, and tempeh.

Evolution of the Probiotic Concept Walter J. Dobrogosz, ... Hosni M. Hassan, in Advances in Applied Microbiology, 2010

/www.benefiber.com/

# FOOD RICH IN PROBIOTICS &PREBIOTICS SOMETIMES FAIL, THEN WHAT

Probiotics From Food Products and Gastrointestinal Health

Murat Doğan, ... Hilal DemirkesenBiçak, in Dietary Interventions in Gastrointestinal Diseases, 2019

3.1 Antimicrobial Effects

**Probiotic strains modulate luminal environment and decrease adhesion and cellular invasion by producing some antibacterial products to inhibit the growth of pathogens.**
Antimicrobial substances produced by probiotics are lactic acid, acetic acid, formic acid, phenyllactic acid, benzoic acid, as well as other organic acids, short-chain fatty acids, hydrogen peroxide, carbon dioxide, acetaldehyde, acetoin, diacetyl, bacteriocins and bacteriocin-like inhibitory substances, and others.[32,36]

These antimicrobial substances are safe and effective natural inhibitors of pathogenic and food spoilage bacteria in various foods.[37]

Several lactobacilli are responsible for producing bacteriocins. The inhibitory action of these bacteriocins varies from inhibiting other lactobacilli to directly inhibiting a wider range of Gram-positive, Gram-negative bacteria, viruses, and certain fungi. Another probiotic, *Lactobacillus salivarius* subspecies salivarius UCC118, produces a 2-peptide bacteriocin, ABP-118, which inhibits several pathogens, including *Enterococcus, Bacillus, Listeria, Staphylococcus*, and *Salmonella* species.[38] Thus, antimicrobial activity against pathogens is a desirable property of a potential probiotic strain.

# WHICH PROBIOTIC SUPPLEMENTS?

ESSENTIALS FOR QUALITY PROBIOTIC

Look for strain diversity, most only include lactobacillus or Bifidobacterium strains

If possible, several to  12 unique strains

Choose one that has at least 50 billion CFUs

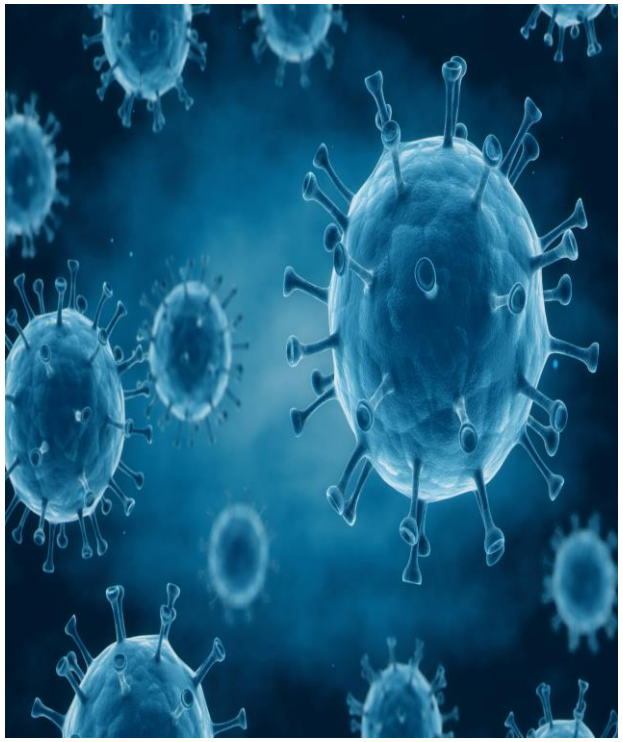
A quality brand will indicate the studied strains by listing the sub strains

You likely don’t need to take these every day. Again looking for balance

www.reviewscout.org

Advent Hospital formulary is Culturelle and previously was Bio K Plus

# SUPPORT GOOD BACTERIA, NOT THE BAD THAT MAKES US SICK



Goal is to support good bacteria but not bad bacteria that can make us sick, balance.

1. Strong intestinal gut lining
2. Healthy diet, not Standard American Diet
3. The MICROBIOME can recover at any age with support WE SHOULD BELIEVE THAT GIVEN THE RESEARCH NOW DEVOTED TO THE MICROBIOME

# THE FUTURE OF FECAL TRANSPLANTS WHEN FOOD DOESN'T WORK

WHOLE INTESTINAL MICROBIOTA TRANSPLANTS VERSUS FECAL MICROBIOTA TRANSPLANTS

# REVOLUITIONARY METHOD OF TREATING GI DISORDERS

"The small intestine (SI) including jejunum and ileum is a harsh microenvironment for microbial life because of the shorter transit time, lower pH values, and higher levels of oxygen and antimicrobials than the hindgut, and therefore, is dominated by rapidly growing facultative anaerobes such as Enterobacteriaceae and Lactobacteriaceae [17, 18].

In contrast, the large intestine (LI) including cecum and colon dominantly hosts a number of saccharolytic anaerobes such as Bacteroidaceae, Prevotellaceae, Rikenellaceae, Lachnospiraceae, and Ruminococcaceae [17, 18].

The small-intestinal microbiota is mainly responsible for simple carbohydrates and amino acid metabolism, while the large-intestinal community is more favorable for the fermentation of complex polysaccharides [17–19]."

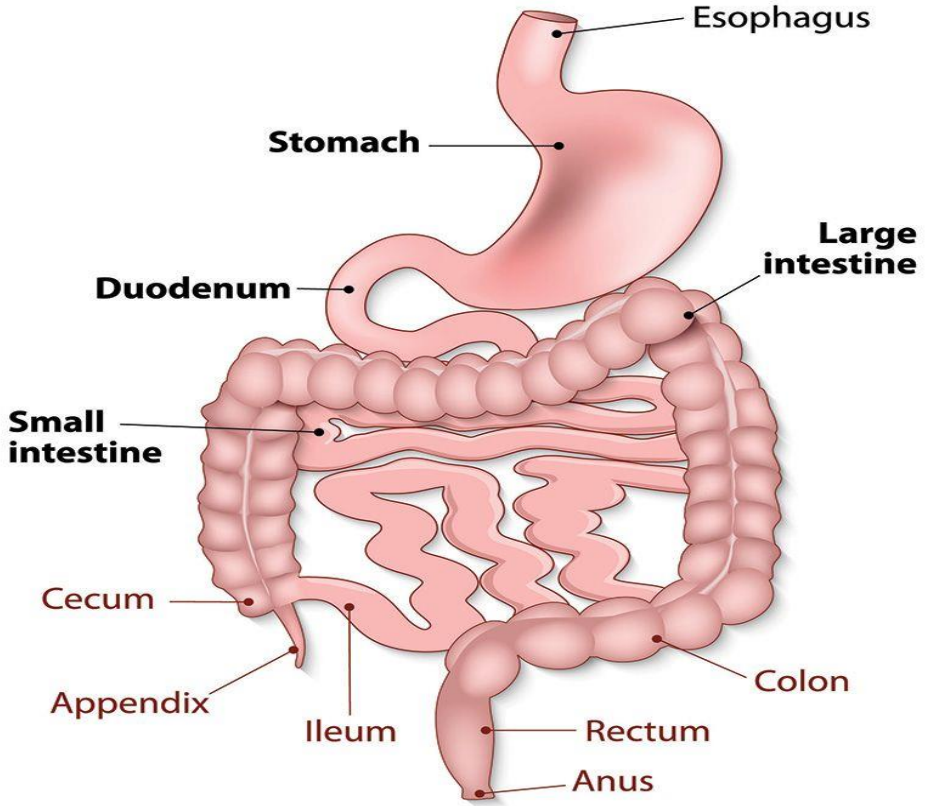
Front Bioeng Biotechnol. 2020; 8: 299.Published online 2020 May 13. doi: 10.3389/fbioe.2020.00299 PMCID: PMC7237573 PMID: 32478040 **Rewiring of Microbiota Networks in Erosive Inflammation of the Stomach and Small Bowel** Xiao-Yu Chen,[1,†] Hui-Ning Fan,[1,†] Huang-Kai Zhang,[2] Huang-Wen Qin,[1] Li Shen,[3] Xiang-Tian Yu,[3,*] Jing Zhang,[1,*] and Jin-Shui Zhu[1,*]

# THEORY WAS: NOVEL APPROACH- WHOLE INTESTINAL MICROBIOTA TRANSPLANTATION

Whole-intestinal microbiota transplantation [WIMT], including jejunal, ileal, cecal and colonic microbiota is more effective than Fecal Microbiota Transplantation in re shaping the entire intestinal microbiota.

WIMT also improved intestinal morphological development as well as reduced systematic inflammation responses of recipients compared with FMT.

Microbiome. 2020; 8: 161. Published online 2020 Nov 18. doi: 10.1186/s40168-020-00917-7 PMCID: PMC7677849. PMID: 33208178 **Spatial heterogeneity of bacterial colonization across different gut segments following inter-species microbiota transplantation** Na Li,[1] Bin Zuo,[1] Shimeng Huang,[1] Benhua Zeng,[2] Dandan Han,[1] Tiantian Li,[1] Ting Liu,[1] Zhenhua Wu,[1] Hong Wei,[3] Jiangchao Zhao,[4] and Junjun Wang



# CLINICAL RESEARCH COMPARING FECAL MICROBIOTA TRANSPLANT TO WHOLE INTESTINAL TRANSPLANT TO RESTORE HOST HEALTH

Compared with the conventional Fecal Microbiota Transplant, Whole Intestinal Microbiota Transplantation might contribute more to the colonization of exogenous small-intestinal microbes and microbial functional profiles in the recipient intestine as well as be more beneficial to intestinal development and host health. Our study contributes to a better understanding of the reconstitution of exogenous microorganisms by FMT and provides novel insights for the use of WIMT as a promising alternative therapy for conventional FMT in mammals

**Spatial heterogeneity of bacterial colonization across different gut segments following inter-species microbiota transplantation.**Na Li,[1] Bin Zuo,[1] Shimeng Huang,[1] Benhua Zeng,[2] Dandan Han,[1] Tiantian Li,[1] Ting Liu,[1] Zhenhua Wu,[1] Hong Wei,[3] Jiangchao Zhao,[4] and Junjun Wang[1]Author information Article notes Copyright and License information Disclaimer

# WITH WHOLE INTESTINAL MICROBIOTA TRANSPLANT WAS SUPERIOR TO FECAL MICROBIOTA TRANSPLANT

## Differences in reconstituting the gut microbiota structure between FMT and WIMT

Based on the above-mentioned results, the bacterial community derived from a certain gut segment might prefer to reside in its corresponding gut regions in the recipients. Feces as the excreted residue contain the majority of microbial species and functionality in the LI [19]. We hypothesized that only part of the donors' large-intestinal microorganisms could be transferred into the recipient LI by FMT, leaving the small-intestinal microbiota unaffected. Therefore, we next conducted a follow-up test to examine whether transplanting the whole-intestinal microbiota was more efficient at reshaping the gut microbiota structure compared with the conventional FMT. **Discussion**

# RESULTS OF RODENT TRANSPLANTATION OF MICROBIOTA BACTERIAL COLONIZATION OF SI AND LI

RESULTS: Rodent Transplantation of microbiota of bacterial colonization of a specific gut segment of small intestine and large intestine preferentially populate their appropriate location

Exogenous jejunal or ileal microbiota resulted in greater number small intestinal organisms Proteobacteria, Lactobacillaceae, and Cyanobacteria.

Bacteroidetes, Prevotellaceae, Lactobacillus, Lachnospiraceae, and Ruminococcaceae of saccharolytic anaerobes prefer population the large intestine.

**Spatial heterogeneity of bacterial colonization across different gut segments following inter-species microbiota transplantation.** Na Li,[1] Bin Zuo,[1] Shimeng Huang,[1] Benhua Zeng,[2] Dandan Han,[1] Tiantian Li,[1] Ting Liu,[1] Zhenhua Wu,[1] Hong Wei,[3] Jiangchao Zhao,[4] and Junjun Wang[1] Author information Article notes Copyright and License information Disclaimer

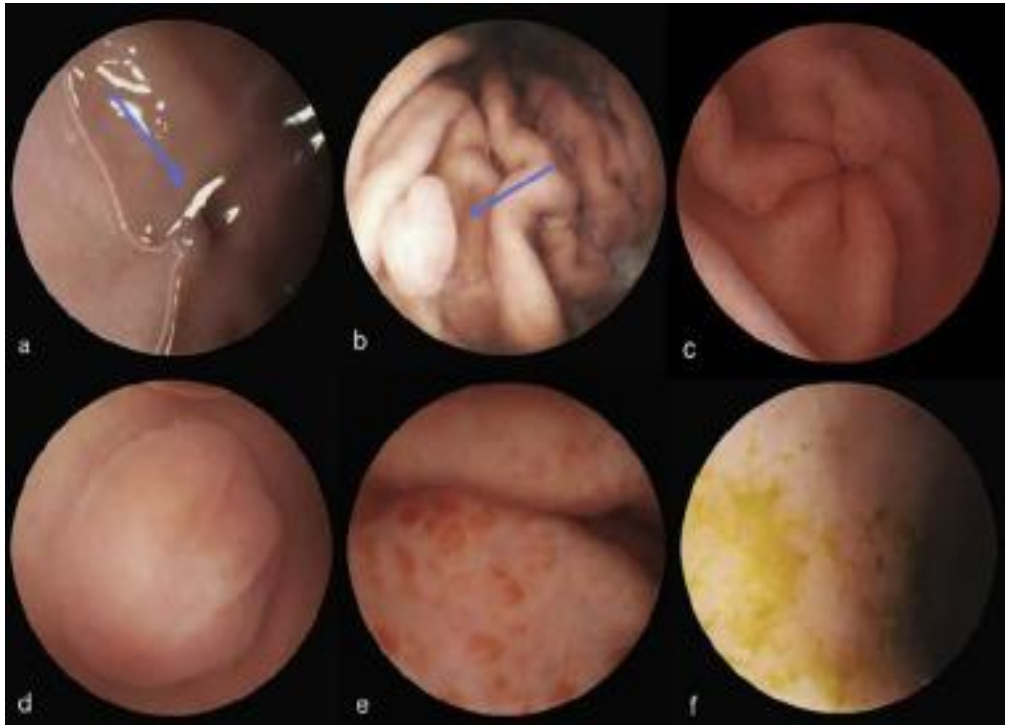
# MAGNETICALLY GUIDED CAPSULE ENDOSCOPY [MGCE]

WE NEED TO BE ABLE TO “illuminate the components of the fecal microbiome and the importance of specific bacteria in CHRONIC GASTRITIS and small-bowel erosions and could be employed to develop preventive and non-invasive therapeutic strategies.”

Magnetically guided capsule endoscopy (MGCE) has aided examination of the small bowel for diagnoses.

VERSUS TRADITIONAL CAPSULE ENDOSCOPY UTLIZING NATURAL PERISTATLSIS

Front Bioeng Biotechnology. 2020; 8: 299 Published online 2020 May 13. doi: 10.3389/fbioe.2020.00299
PMCID: PMC7237573 PMID: 32478040 **Rewiring of Microbiota Networks in Erosive Inflammation of the Stomach and Small Bowel** Xiao-Yu Chen,[1,†] Hui-Ning Fan,[1,†] Huang-Kai Zhang,[2] Huang-Wen Qin,[1] Li Shen,[3] Xiang-Tian Yu,[3,*] Jing Zhang,[1,*] and Jin-Shui Zhu[1,*]



# THE FUTURE WILL LIKELY WHOLE INTESTINTAL MICROBIOTA TRANSPLANT TO RESTORE SMALL AND LARGE INTESTININAL FLORA


ABSTRACT:

Over the past decade, the effectiveness of FMT in the therapy of a series of gut infections has attracted much attention to its potential application [9].

Nonetheless, the mammalian intestine contains diverse microbial niches with compartmentalized physiological variations, such as jejunum, ileum, cecum, colon, feces, etc., which are responsible for the segmented distribution of the intestinal microorganisms [16–18].

Although it is now acknowledged that the bacterial communities are significantly discrete among different microhabitats, it remains unclear whether the community membership derived from a particular gut niche only selectively identifies and resides in its homologous gut location.

The fecal community contains a large proportion of microbial species of the large-intestinal microbiota with sparse small-intestinal microbes [19, 22].

Therefore, we speculated that transplanting the microbiota derived from both SI and LI might be more effective for reshaping the entire intestinal microbiota, particularly the SI microbiota, and the treatment of gut diseases than the conventional FMT.

Here, for the first time, our study demonstrated the spatial heterogeneity of exogenous bacterial colonization through inter-species microbiota transplantation from pig to germ-free mice. Our results showed that microorganisms and microbial functional genes derived from one particular intestinal segment were more inclined to colonize its homologous gut niche of the recipient.

**While FMT administration, which has been used as a surrogate of the LI, transferred a part of LI-derived microorganisms into the recipient LI, it transferred very few SI-derived microbes to the recipient SI. In contrast, compared with FMT, WIMT, which also contains contents from the SI, could contribute more to the colonization of small-intestinal microbes as well as further facilitate intestinal development and health**.



**Spatial heterogeneity of bacterial colonization across different gut segments following inter-species microbiota transplantation.** Na Li,[1] Bin Zuo,[1] Shimeng Huang,[1] Benhua Zeng,[2] Dandan Han,[1] Tiantian Li,[1] Ting Liu,[1] Zhenhua Wu,[1] Hong Wei,[3] Jiangchao Zhao,[4] and Junjun Wang[1] Author information Article notes Copyright and License information Disclaimer

# LIKELY SOME SORT OF MULTICHANNEL CATHETER AND/0R SWALLOWABLE CAPSULE WILL BE THE FUTURE DELIVERY SYSTEMS

As for the practical application of the WIMT, non-invasive approaches are being developed such as a customized multichannel catheter [90] and swallowable bio-sampling capsules programmed to sample luminal contents [91]. Moreover, an in vitro dynamic continuous culture system, which allows for strict and stable control of bacterial growth conditions to make it similar to those of the human intestine [92], would be a very powerful approach to produce standardized cultivated cocktails that include bacterial isolates from SI and LI of donors.

**Spatial heterogeneity of bacterial colonization across different gut segments following inter-species microbiota transplantation.** Na Li,[1] Bin Zuo,[1] Shimeng Huang,[1] Benhua Zeng,[2] Dandan Han,[1] Tiantian Li,[1] Ting Liu,[1] Zhenhua Wu,[1] Hong Wei,[3] Jiangchao Zhao,[4] and Junjun Wang[1] Author information Article notes Copyright and License information Disclaimer

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# AGING- YOU ARE AS YOUNG AS YOU FEEL



# TESTING IS COMING THAT IS NONINVASIVE

# G-DAP PRECISION POINT DIAGNOSTICS GUT AND DETOX ASSESSMENT PROFILE

| Marker s level | Detox/ Ox Stress | Gut | Immune/ Cancer/ Prevention | Cardio | Memor Dementia |
|---|---|---|---|---|---|
| Glutathione %Reduced/Total LOW | Major Intercellular Antioxidant | Leaky Gut Major cause ox stress | Reduces DNA mutations | Decrease Glycocalyx | Antioxidant of brain |
| F2 Isoprostane HIGH | Oxidized Lipids=Decrease Neuroprostane | | | Plaque former | Damaged Neuroprotection |
| 8-ohDg HIGH | DNA damage | | Increases Risk | Mitochondrial dysfunction | Mitochondrial dysfunction |
| oXldl HIGH | Increases secondary to toxins | | | Increase Risk | Damage Neuroprastane Decrease nerve conduction |
| | | | | | |

# G-DAP PRECISION POINT DIAGNOSTICS GUT AND DETOX ASSESSMENT PROFILE

| | | | | | |
|---|---|---|---|---|---|
| LPS<br>HIGH | Leading cause of NAFLD | Damages tight junctions | Decreases immune reserves, decrease Treg cells | Oxidizes LDL, Damages Heart | Induces Depression/Anxiety |
| Zonulin<br>HIGH | Leaky Gut=<br>Major cause of ox stress | Opens tight junctions | | | Leaky Blood Brain Barrier |
| DAO<br>LOW | Impairs detox | Atrophy of gut lining causing permeability | Increases TH2 and TH17?branch | | Anxiety, Decrease focus |
| Vitamin D<br>LOW | | If low but patient is taking, possible leaky guy | Decrease risk | Decrease risk | Decrease risk |
| | | | | | |

# REFERENCE LIST


2015 BIOLOGIC MEDICINE

2014 THE GMO DECEPTION

2014 OUR DAILY POISON

2013 DEATH BY FOOD PYRAMID [READ FOURTH]

2012 THE BLUE ZONES [READ FIRST]

2010 SAFE FOOD, THE POLITICS OF FOOD SAFETY

2009 SUPERFOODS [READ FIFTH]

2007 GENETIC ROULETTE

---

1996 INNOCENT CASUALTIES

READ ANYTHING BY DEEPAK CHOPRA MD

ALWAYS HUNGRY BY DR DAVID LUDWIG MD PHD

DR RHONDA PATRICK PHD, YOU TUBE VIDEOS

# REFERENCE LIST


2019, THE LONGEVITY PARADOX BY DR STEVEN GUNDRY, MD,

2018 FOOD, WHAT THE HECK SHOULD I EAT?

2018 FOOD SANITY [READ SIXTH]

2017 THE PLANT PARADOX [READ SEVENTH]

2017 THE END OF ALZHEIMERS DISEASE [READ THIRD]

2016 THE LDN BOOK

2015 ALTERED GENES, TWISTED TRUTH

2015 HOW NOT TO DIE [READ SECOND]

# MEDICINAL PLANTS AND IMMUNE SYSTEM

Either crude extracts or bioactive compounds are capable of boosting host immunity or building resistance against virus and bacteria or modulating the immune response. Immune system protected from disease through a clean colon. Examples of more common botanical agents are licorce, Elderberry, &Sambuca. Quercitin has been shown to lower viral load. Diets rich in micronutrients such as Vitamin C and D may have the potential to prevent or treat COVID by fortifying immune system. Many studies showing that herbs such as garlic [allium sativum]and other botanicals and traditional medicine may have future anti-coronavirus compounds though the mechanism of action in these are yet known.

Less commonly known are bioactive compounds having been isolated from its leaves including beta-beta-sitosterol, beta-sitosteryl-glucoside, +-catechin, - epicatechin, gallic acid, kaempferol, kaempferol-d-glucoside, methyl gallate, phytol, quercetin, rutin, stigmasterol, stigmasterol glucoside and tosedndanin.

Research involving quercetin is being tested in clinical trial since it is a strong antioxidant as a prophylactic effect against tofenacin COVID-19 (Di Matteo et al., 2020).

2021 Jan 11;11:589044. doi: 10.3389/fphar.2020.589044. eCollection 2020. **A Review on Plant Bioactive Compounds and Their Modes of Action Against Coronavirus Infection** Juwairiah Remali[1], Wan Mohd Aizat[1] PMID: 33519449 PMCID: PMC7845143 DOI: 10.3389/fphar.2020.589044

# SUMMARY-WHAT DO I DO DAILY?

**Supplements**

HOW MUCH: Daily I HEALTHY FOOD CH0ICES AND:

1. High quality multivitamin/multimineral that includes key antioxidants (vitamin C, vitamin E, mixed carotenoids, and selenium);
2. Coenzyme Q10;
3. 2 to 3 grams of a molecularly distilled fish oil;
4. 2-5,000 lU ol vitamin D3 daily with fat

**WHY:** Supplements help fill gaps in your diet when you are unable to get your daily requirement of micronutrients.

**Testing:** Some routine labs can tell us if there are deficiencies otherwise specialty testing through Spectra Cell and Genova can lead us to micro nutrition deficiencies.

# THANKYOU TO DIGESTIVE AND LIVER CENTER OF FLORIDA FOR SPONSORING THIS EDUCATIONAL EVENT AND TO DAVE RUSSELL FOR MAKING THIS EVENT HAPPEN

# COMMON THEMES FOR SUCCESS

- 1. They were ready to lead a different life
- 2. They changed their relationship with Food
- 3. They discovered tools to help them- apps, books, programs, doctor visits
- 4. They all lowered their total carbohydrate Intake
- 5. They all started to exercise routinely
- 6. They started to go shopping and purchased differently
- 7. They started meal preparation for the week
- 8. When eating out, they stopped eating bread and potatoes and stopped alcohol except occasionally and started eating more greens
- 9. They all started supplements to support micronutrients
- 10. They all had support of health professional

# THE PROBLEM

We started using genetically modified seeds and Glyphospate, insecticides and pesticides and plastics and these endocrine disrupters affect metabolism

We Stopped growing our own foods

We  Stopped Cooking for Our selves when convenience foods were developed

We took antibiotics when not needed

We were told Convenience/Processed food were healthy and economical

We were told Low Fat was Healthier – Many believe that research is Flawed

We were told all Fat is Bad?

Then the Books, then the experts but what is real? What is right?

We forgot how to cook

We think we don’t have time to cook and eat at home

# OBJECTIVES

1. To Re Learn What We Think We Know

2. To Change Our Relationship With Food; What makes other Successful Can make you Successful

3. To Find What Works For Us, Review Current Diet Trends

4. To Discover A Strategy How To Eat Healthy Delicious Foods

5. How Eat Healthy on the Run is Possible Through  Knowledge

    a. Learn from childhood

    b. Other successful Examples of family, friends, Netflix or Books

# RELATIONSHIP WITH FOOD

Emotional Eating- Don’t shop hungry

Emotional Eating- Don’t have the foods you crave in the house, EVER

Emotional Eating- Food Addiction

Emotional Eating- Consider www.OA.com

Emotional Eating- Consider counselling/medication

Emotional Eating- Consider if related to gut Microbiome Imbalance

Emotional Eating- Is it the Food that you are eating?

# DIET RECOMMENDATIONS OFTEN CONFLICTING AND CHANGE OVER TIME

AHA- Low Fat Diet that is low in trans fats, low in saturated fats,low all fats

Eat for your Blood Type

Vegan/Vegetarian/Paleo/Whole 360 Diet

Dr Caldwell Esselstyn - No Fat/Whole Plant Based Eating to Reverse Heart Disease

Whole 360

Ketogenic Diet- Fat for Fuel by Dr Joseph Mercola, MD

Mediterranean Diet/The Blue Zones

Dr Steven Gundry, MD The Plant Paradox

# EAT A BALANCED DIET WITH EXERCISE

Exercise

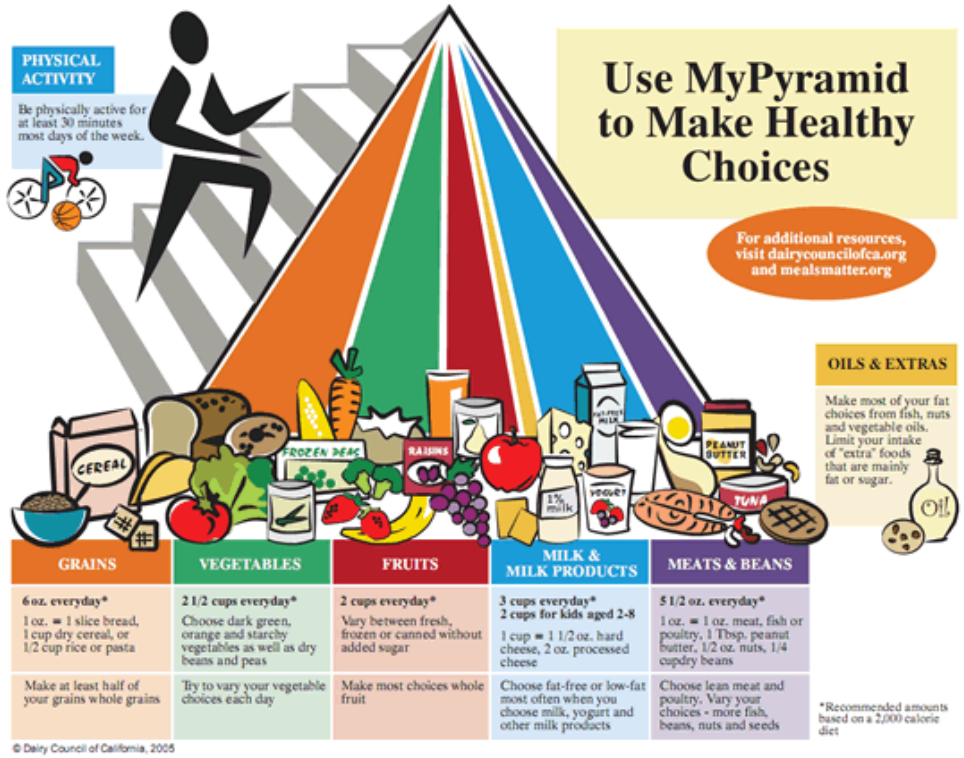
Grains

Vegetables

Fruits

Milk and Milk Products

Meats and Beans



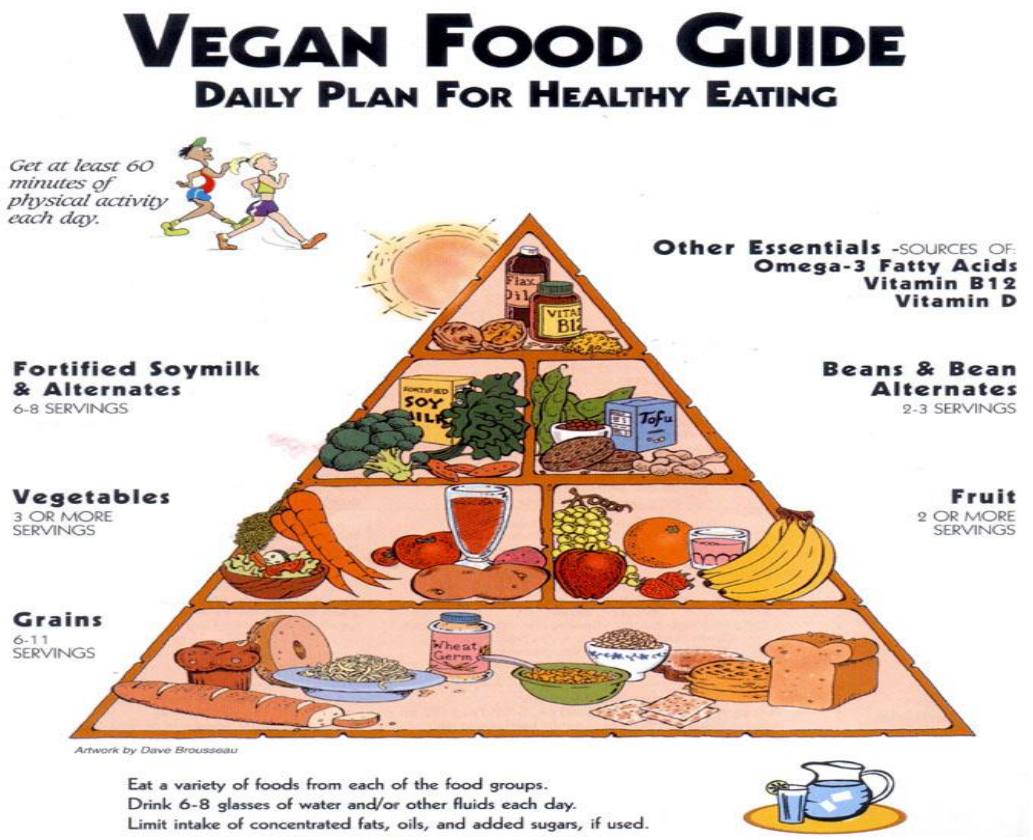
# VEGETARIAN DIET

Most consist of eating plant-based foods along with moderate amounts of eggs and dairy (but no meat). The staples of a balanced vegetarian diet include a variety of plants like fresh or cooked veggies, fruit, nuts, seeds, whole grains and legumes.

Plants are low in calories but high in essential vitamins, minerals and antioxidants, vegetarian diets can be very nutrient-dense.

Research published in the *Proceedings of the Nutrition Society* found that "vegetarian diets are usually rich in carbohydrates, **omega-6 fatty acids**, dietary fiber, **carotenoids**, folic acid, vitamin C, vitamin E and magnesium, and relatively low in protein, saturated fat, long-chain **omega-3 fatty acids**, retinol, vitamin B12 and zinc."

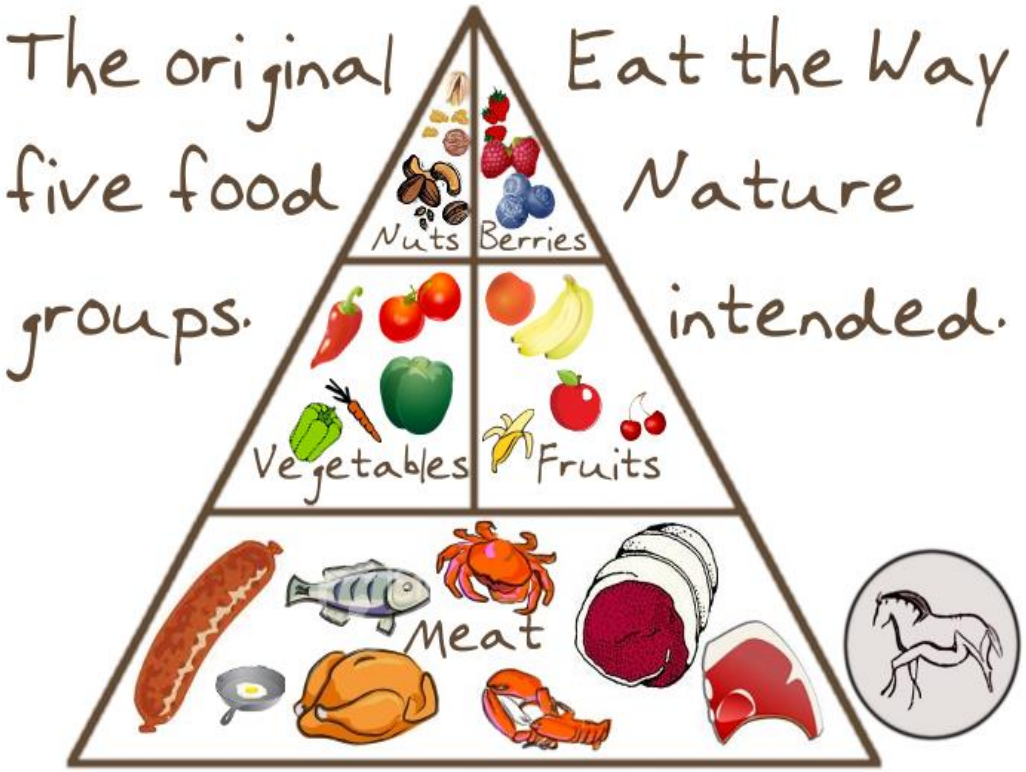
# VEGAN DIET – NO ANIMIAL PROTEINS




Those following a vegan diet abstain from ALL animal products and consume only plant-based foods (NO meat, fish, eggs, or dairy).

-ND

# PALEO DIET http://planpaleo.us/paleo-meal-plan




**Vegetarian vs. Ovo-lacto Vegetarian:**

A "strictly" vegetarian diet consists of plant-based foods, but may also include eggs and dairy. Typically no fish or meat of any kind will be included. When eggs and dairy products are included, it's called an ovo-lacto vegetarian diet (hence the name ovo, as in "ovum," and lacto, as in "lactation").

**Vegetarian vs. Pescatarian** Diet

Pescatarian diets include fish and seafood along with a variety of plant foods (vegetables, fruits, nuts, grains, beans, etc.). Most also include eggs and dairy but no poultry, beef or red meat, although it depends on the individual.

**Vegetarian Diet vs. Vegan Diet:**

Those following a vegan diet abstain from ALL animal products and consume only plant-based foods (NO meat, fish, eggs, or dairy).

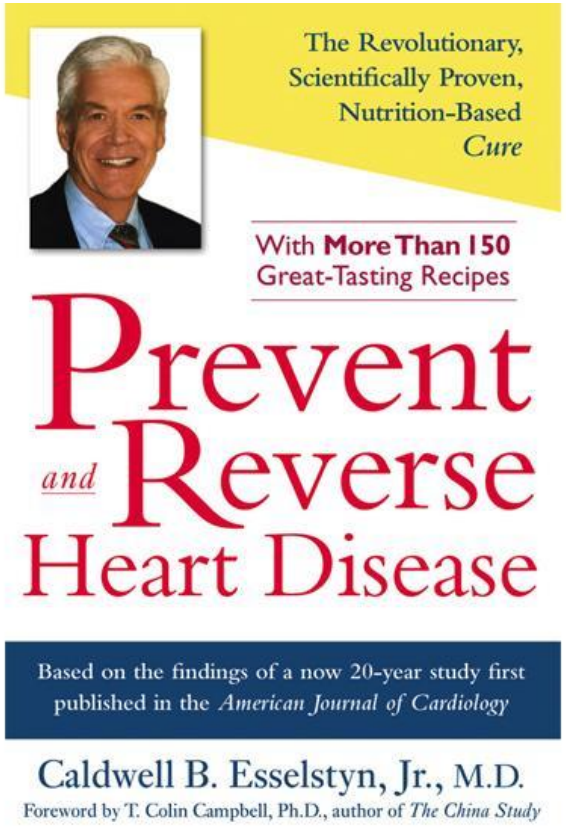
Some vegans choose to take things a step further and stick with to a mostly "**raw food diet**." Going on a purely raw diet may sound a bit extreme, but if you look at the food most people tend to eat all the time, you'll realize that adding raw food to your diet may be beneficial to your body and overall health. Note, however, that folks dealing with digestive issues, such as **leaky gut syndrome**, are best keeping raw foods to a minimum.

# Whole Food Plant Based Diet/Whole 360

Esselstyn promotes a diet that is restricting nothing v a face can be eaten; no oils or fats including olive oil. This is a whole food plant based diet avoiding all processed foods and is featured in the documentary Forks Over Knives.

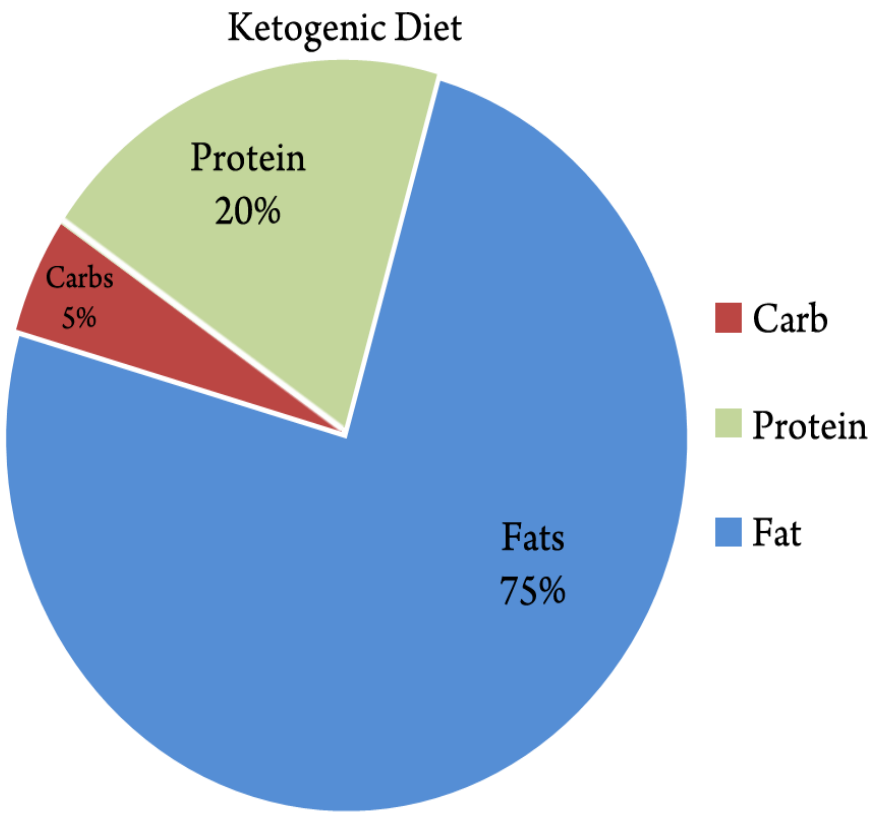
This diet is endorsed by President Bill Clinton and sim to work by Dean Ornish, The China Study.

Mainstream authorities agree that a plant based diet avoiding processed foods is a healthy diet.



# MEDITERRANEAN DIET

# Ketogenic Diet – Fat for Fuel Dr. Joseph Mercola, MD




Seizure Disorders

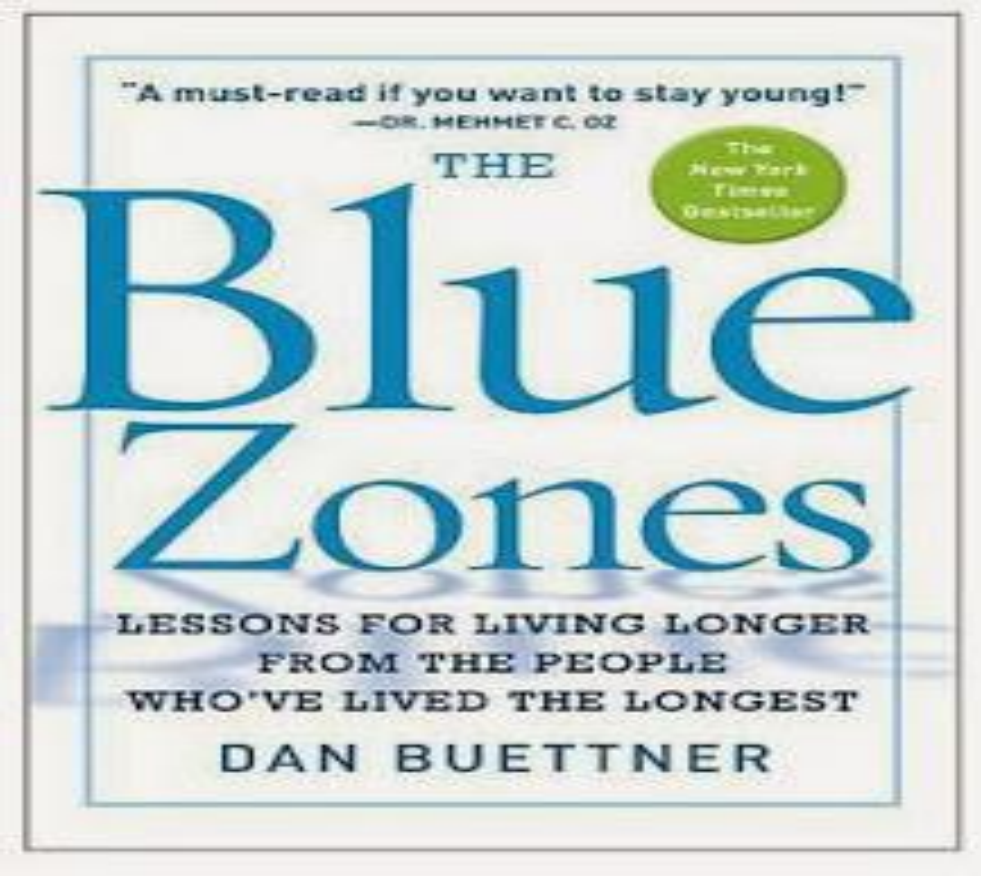
Cancer Support

Weight Loss

They can help you lose fat, preserve muscle mass and improve many markers of disease and lowering insulin levels.

In one study, people on a ketogenic diet lost 2.2 times more weight than those on a low-calorie, low-fat diet. Triglyceride and HDL cholesterol levels also improved

# LESSONS FOR LIVING LONGER






To answer the question, we teamed up with National Geographic to find the world's longest-lived people and study them. We knew most of the answers lied within their lifestyle and environment (The Danish Twin Study established that only about 20% of how long the average person lives is determined by genes.). Then we worked with a team of demographers to find pockets of people around the world with the highest life expectancy, or with the highest proportions of people who reach age 100.