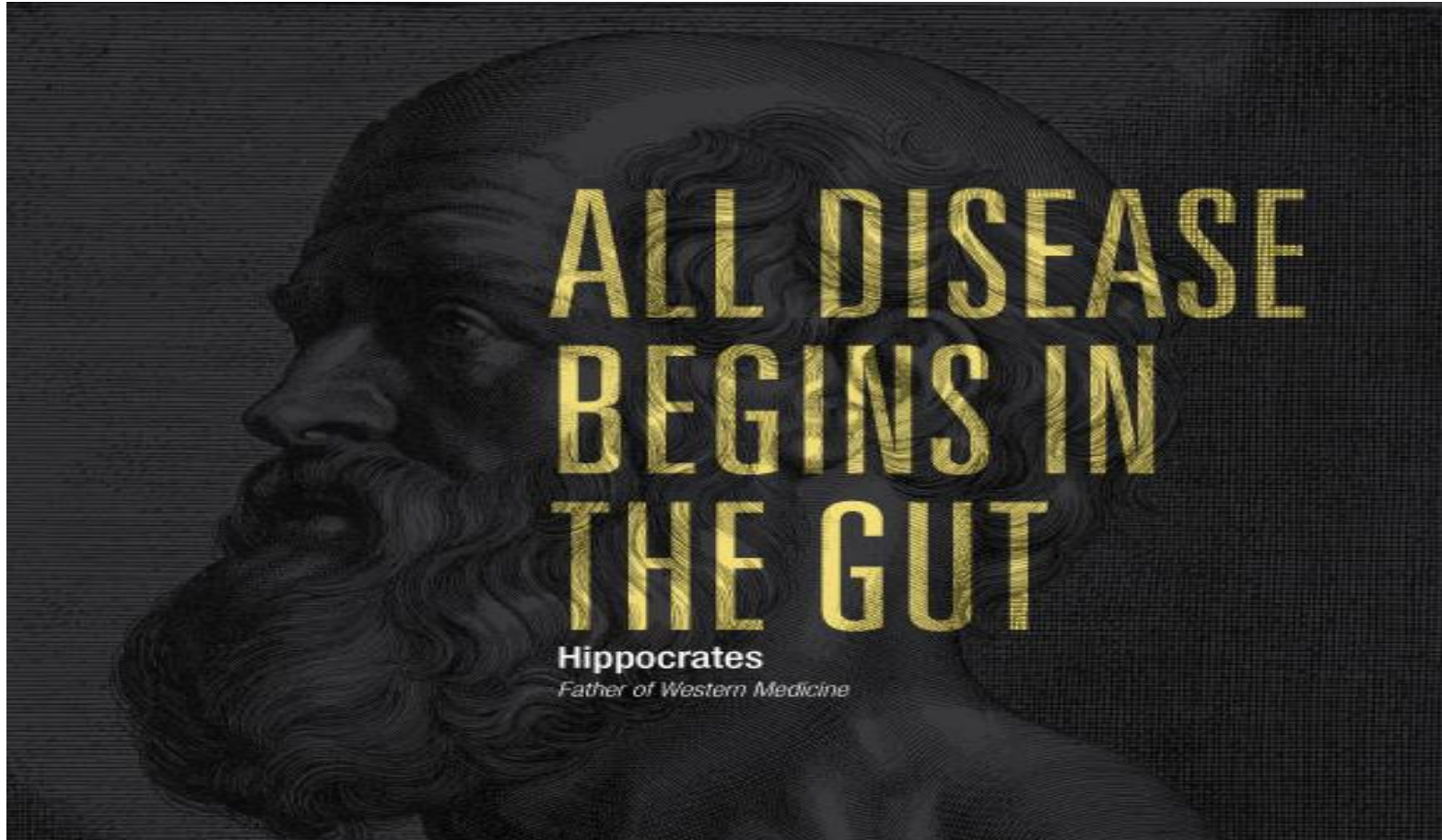


# Nutrition And Digestive Health

Randy Pendergrass LSN, CSCS, LMT

[randycscs@gmail.com](mailto:randycscs@gmail.com)

# HIPPOCRATES, 460-360 BC



# Burden of Gastrointestinal Diseases in the United States

- \* Gastrointestinal disease affects 60-70 million U.S. citizens (reported)
- \* Americans spent ~\$175 billion in 2010 on digestive diseases
- \* Acid reflux drugs are second most prescribed drugs in U.S.
- \* IBS is the second most common cause for missed work.
- \* Digestive diseases account for over 21 million hospitalizations and over 250,000 deaths each year



# Common Digestive Disorders

- GERD
- IBS: (IBS-D and IBS-C)
- Ulcerative Colitis
- Crohn's
- Diverticulosis & Diverticulitis
- SIBO
- Leaky Gut Syndrome
- Gallstones
- Appendicitis
- Hemorrhoids



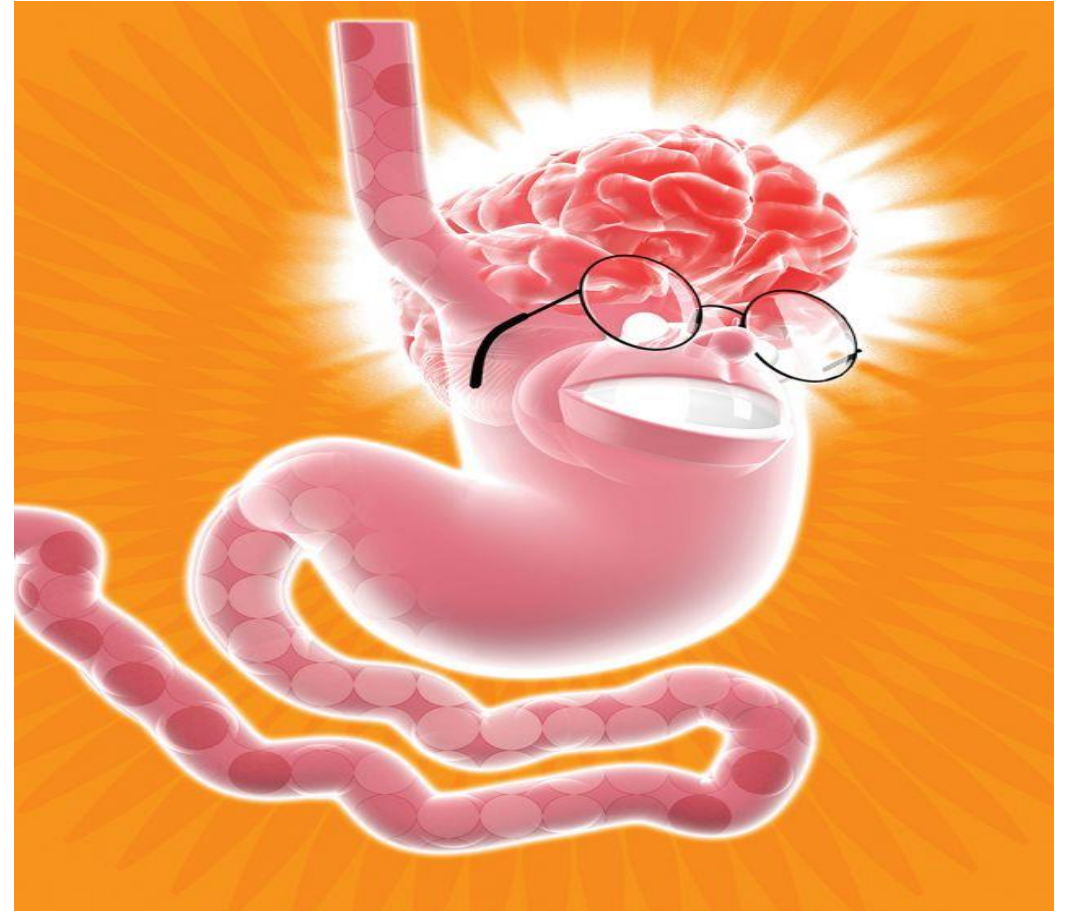
# Gut Facts

- Your gut is your “Second Brain”
- Enteric Nervous System
- 95% of the serotonin in your body is in your gut.
- 50% of the dopamine is in your gut
- You make 400 times more melatonin in your gut than in your brain (mostly made by your gut bugs and stored in the appendix)
- You have 10 times more microbes in your colon than cells in your body
- The genes of your gut flora are 100 times greater than our own
- Around 80% of your immune system is located in the gut (GALT)



# The Second Brain

- More nerve cells in the gut than the spinal cord or the peripheral nervous system
- The vagus nerve is the primary connection between the 2 brains
- New research shows most of the information is from gut to brain
- Many of our mood influencing neurotransmitters like serotonin are made in the gut
- Helps the gut function on its own
- Mental issues like anxiety and depression may arise first in the gut (inflammation)



# Melatonin

- Sleep- regulates our circadian rhythm (sleep-wake cycle)
- Once thought to be only in the brain (pineal gland)
- Very powerful antioxidant
- Protects stomach lining from toxins like NSAID's
- Reduces stomach acid while you are sleeping
- Regulates LES and UES pressure regulation
- Increases blood flow to esophagus for quick healing
- Reduces bowel spasms



# How to Increase Melatonin Production

- Get your gut in good shape
- Probiotics? Prebiotics?
- Minimize light exposure at night
- Beware of blue light
- Blue light blocking glasses
- Install F.lux on your computer
- Blue light screens
- Night lights for kids
- Don't sleep with a full stomach
- Consume a SMALL amount of carbohydrate before bed (milk)





# The Human Gut Flora

- 5 times more microbes in the gut than cells in your body
- Over 500 different strains have been identified
- The gut flora is thought to be ~85% beneficial and 15% pathogenic in a healthy person
- There is a mixture of bacteria and yeast (candida)



# Importance of Fiber

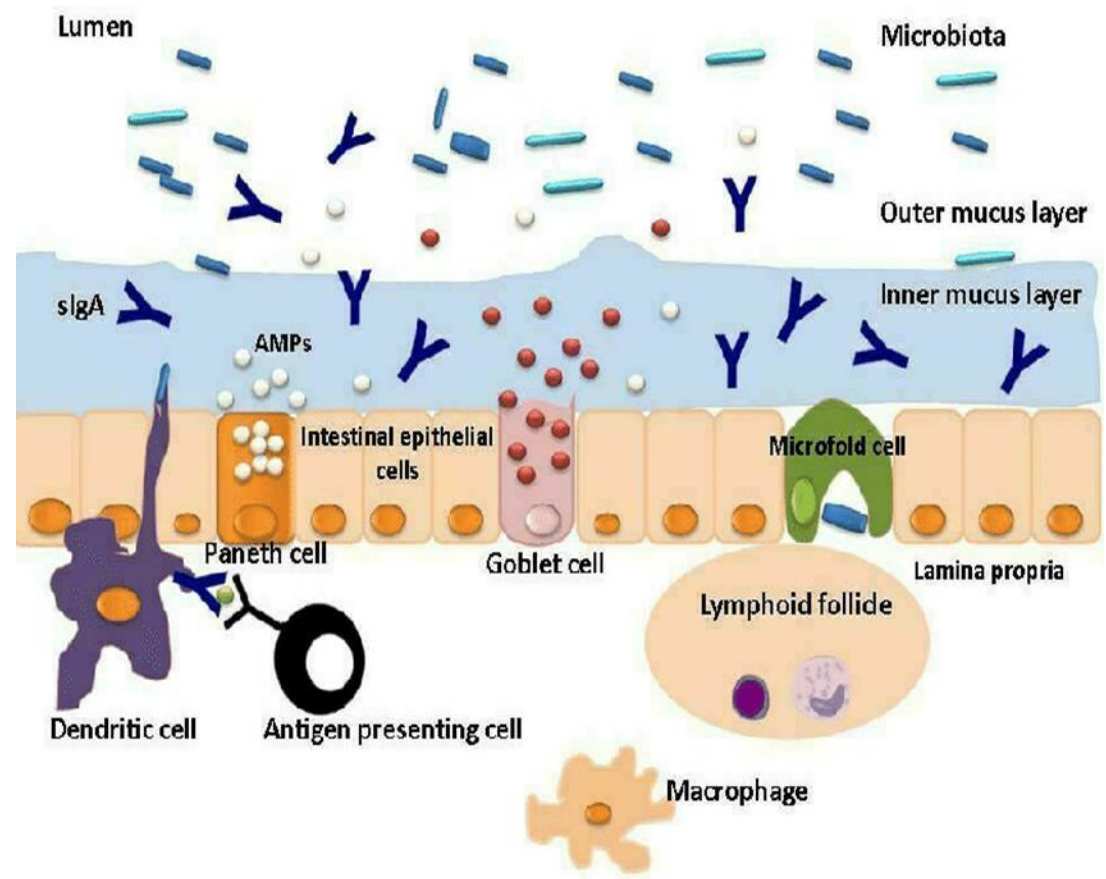
- Bacteria ferment soluble fiber and resistant starch, which produces short chained saturated fats:

Butyric acid

Propionic acid

Acetic acid

- These short chained saturated fats are used by Goblet cells to make Mucus
- If the microbes are starved they may begin to consume the mucus
- Without the short chained saturated fatty acids the goblet cells starve and make less mucus

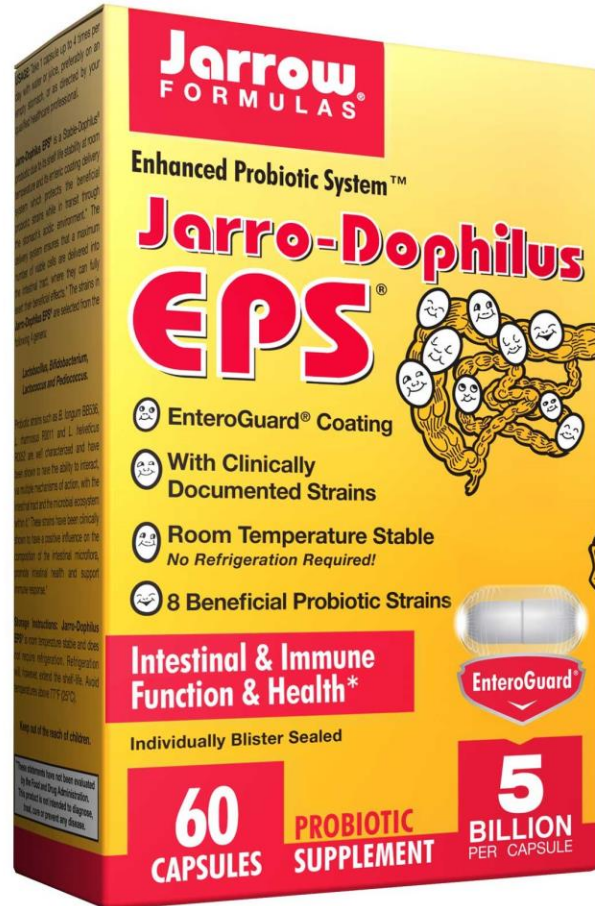


# PROBIOTICS

- Bifidobacteria strains
- Lactobacillus strains
- Saccharomyces boulardii
- Streptococcus
  - \**Streptococcus salivarius*
  - \**Streptococcus thermophilus*

- Do not use if immune system is severely compromised.
- If gut is in bad shape an infant formula may be best to start
- Take on empty stomach (bedtime?)
- Take with non-chlorinated water
- People with histamine issues should be careful with fermented foods and probiotics

# Jarro-Dophilus



## Supplement Facts

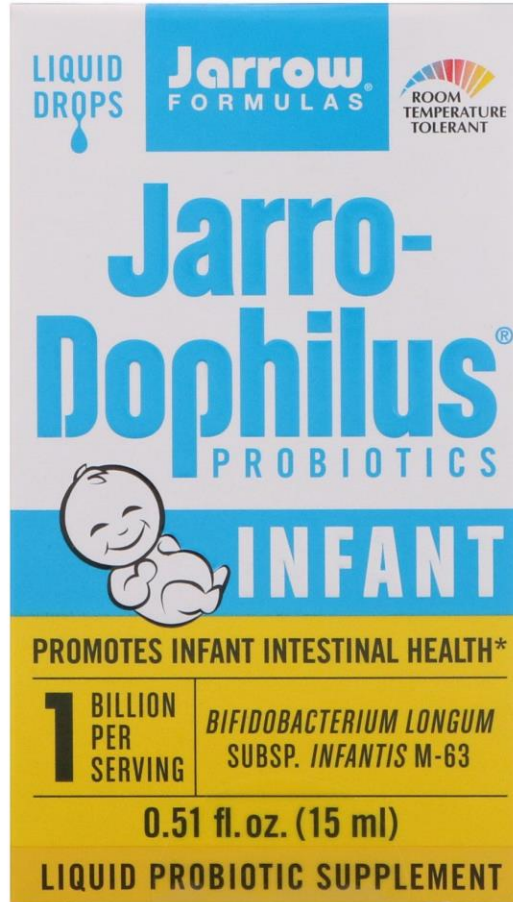
Serving Size 1 Capsule

Servings Per Container 60

	Amount Per Serving	% DV
Probiotic Bacteria Blend	5 Billion Viable Cells	†
Composed of the following strains:		
<i>Lactobacillus rhamnosus</i> R0011	<i>Lactobacillus helveticus</i> ( <i>L. acidophilus</i> ) R0052	
<i>Pediococcus acidilactici</i> R1001	<i>Lactobacillus casei</i> R0215	
<i>Bifidobacterium longum</i> BB536	<i>Lactobacillus plantarum</i> R1012	
<i>Bifidobacterium breve</i> R0070	<i>Lactococcus lactis ssp. lactis</i> R1058	

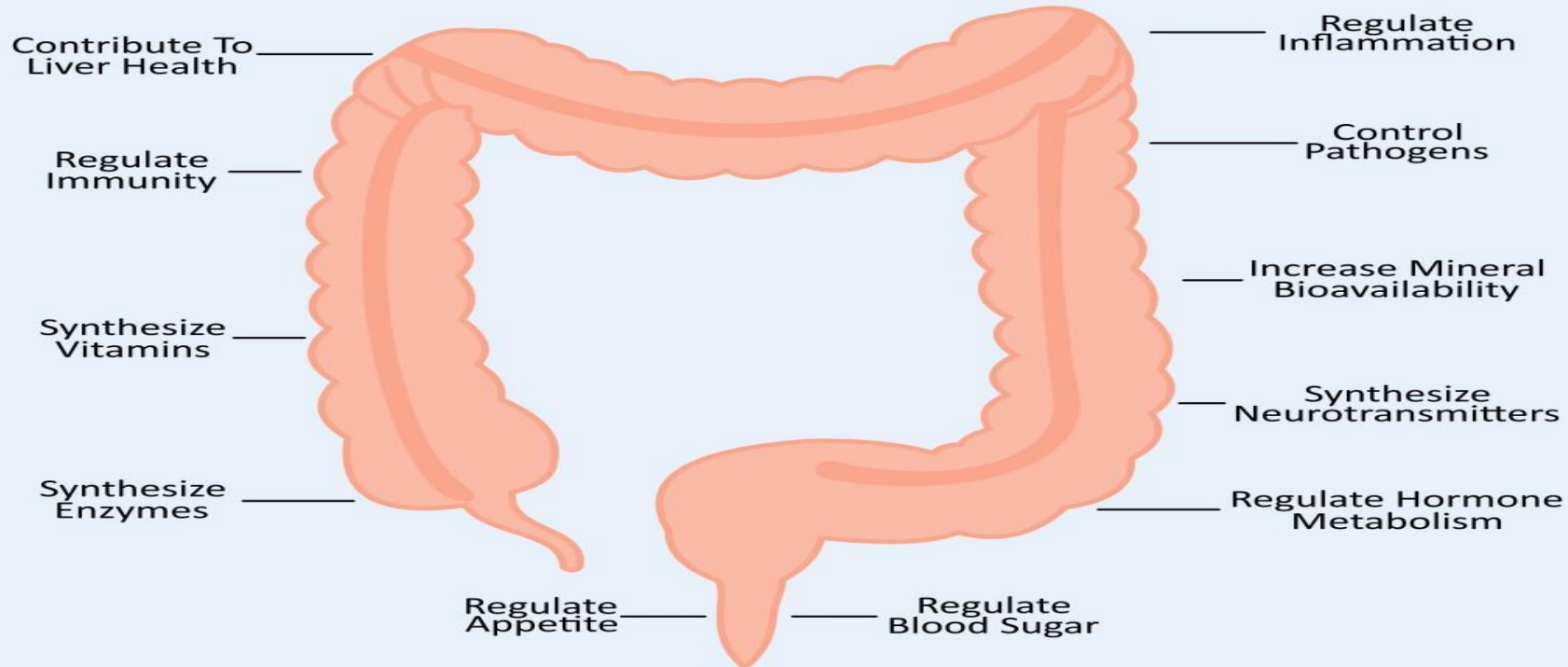
† Daily Value not established.

# Infant Probiotics



# What Do The Gut Bugs Do?

## Functions Of The Gut Flora



# What Is Creating all the Digestive Issues?

- Antibiotics
- Too much refined sugar
- Not enough good fiber
- Too many medications
- Chronic Stress
- Chronic Infections
- C-sections?
- Pollution
- Low Stomach Acid



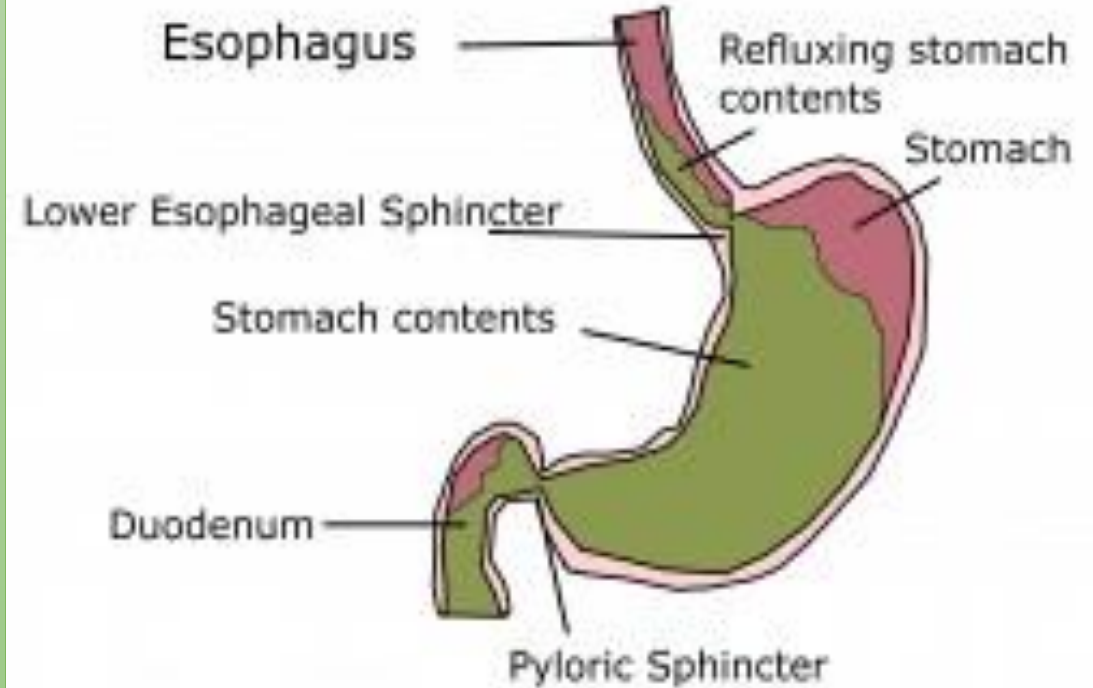
# Appendix: A Vestigial Organ?

- Only found in a few animals
- Once thought to digest tree bark (Darwin)
- Vital part of our immune system
- Lymphoid tissue accumulates right after birth
- Helps in maturation of immune cells (B cells)
- Produces antibodies
- Helps re-colonize beneficial microbes after infection
- Stores Melatonin, and maybe other neurotransmitters
- People without an appendix are far more likely to develop IBS or SIBO



# What Causes Acid Reflux?

- Too much acid or too little?
- Dysfunction in the LES
- The stomach can handle HCL, the esophagus can not
- Those with Zollinger-Ellison Syndrome are an exception
- ZES is caused by a tumor in the small intestine, pancreas, or lymph nodes by the pancreas
- ZES is rare. Occurs in about 1 in 1 million people



# Conventional Treatment for Acid Reflux

## Acid Neutralizers

\*Antacids: Tums, Rolaids  
Maalox, Mylanta, etc.

## Acid Suppressors

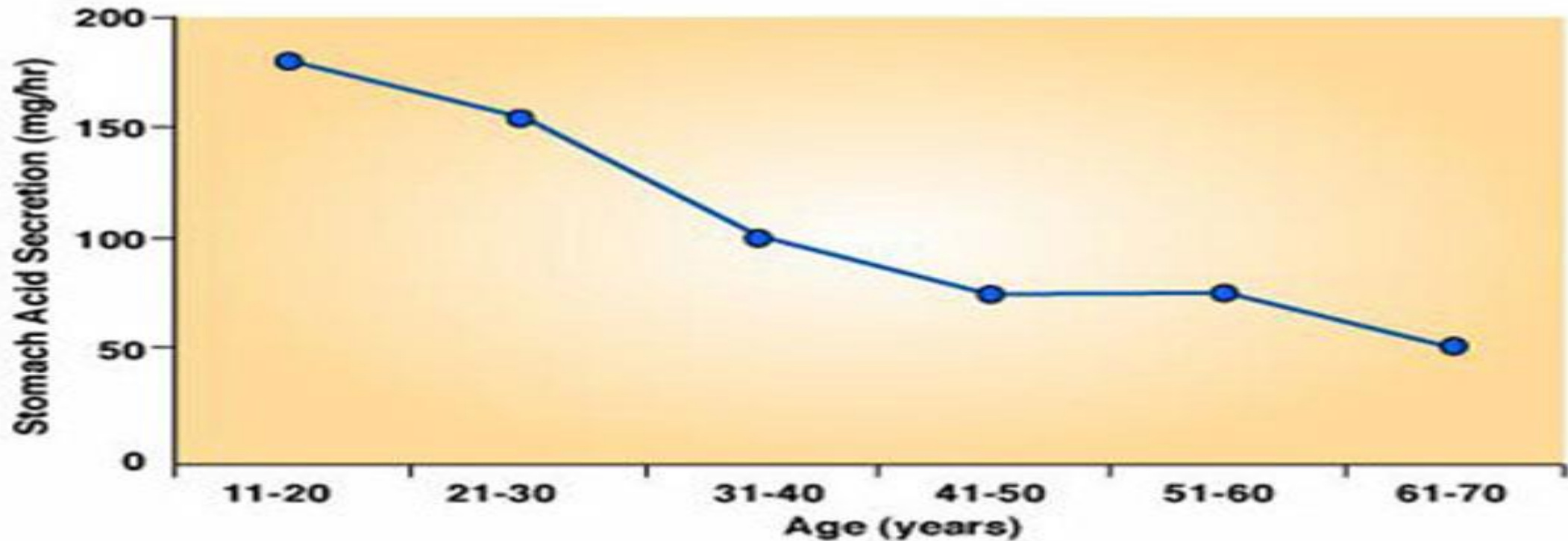
\*Histamine blockers:  
Zantac, Tagamet, Pepcid, etc.

## Proton Pump Inhibitors

\*Prilosec, Nexium, Prevacid,  
etc.



# *“Why Stomach Acid Is Good For You”* by Jonathan Wright, M.D.



**Fig. 1.** Contrary to popular belief, stomach acid secretions drop with advancing age. This graph shows average decline in stomach acid secretion in humans between age 20 to age 80. (From *“Why Stomach Acid is Good For You.”*)

# *Journal of Gastroenterology; July 2009*

## *editorial*

- ***Treating gastroesophageal reflux disease with profound acid inhibition will never be ideal because acid secretion is not the primary underlying defect.***

*It is never ideal to treat 1 abnormality by creating another, as was the case for many years with management of ulcer disease before the discovery of H pylori infection.*

*The pathophysiology of acid reflux concerns the dysfunction of the gastroesophageal barrier and research needs to refocus on ways of restoring its competence rather than merely suppressing gastric acid secretion.*

# What Causes the LES to Malfunction?

- Intra-abdominal pressure
- High blood sugar/High Insulin
- Overweight
- Overeating
- Lying down after eating
- Low stomach acid
- Bacterial overgrowth (H. pylori)
- Carbohydrate malabsorption
- Gas
- Bloating and Distention



Effect of hyperglycemia on triggering of transient lower esophageal sphincter relaxations  
American Journal of Physiology- Gastrointestinal and Liver Physiology  
2004 May;286(5);G797-803

- **Abstract**

- Acute changes in blood glucose concentration have major effects on gastrointestinal motor function. **Patients with diabetes mellitus have an increased prevalence of gastroesophageal reflux. Transient lower esophageal sphincter (LES) relaxation (TLESR) is the most common sphincter mechanism underlying reflux.** The aim of this study was to investigate the effect of acute hyperglycemia on triggering TLESRs evoked by gastric distension in healthy volunteers. TLESRs were stimulated by pressure-controlled and volume-controlled (500 ml) gastric distension using an electronic barostat and performed on separate days. On each day, esophageal manometry was performed in the sitting position during gastric distension for 1 h under euglycemia (5 mM), and either marked hyperglycemia (15 mM) or physiological hyperglycemia (8 mM) in randomized order was maintained by a glucose clamp. Marked hyperglycemia doubled the rate of TLESRs in response to both pressure-controlled [5 (3-10.5, median or interquartile range) to 10 (9.5-14.5) per hour,  $P < 0.02$ ] and volume-controlled [4 (2.5-7.5) to 10.5 (7-12.5) per hour,  $P < 0.02$ ] gastric distension but had no effect on basal LES pressure. Physiological hyperglycemia had no effect on the triggering of TLESRs or basal LES pressure. **In healthy human subjects, marked hyperglycemia increases the rate of TLESRs.** Increase in the rate of TLESRs is independent of proximal gastric wall tension. Mechanisms underlying the effect remain to be determined. **Hyperglycemia may be an important factor contributing to the increased esophageal acid exposure in patients with diabetes mellitus.**

# What Causes Stomach Ulcers

- The suspected cause of stomach ulcers and gastritis for most of the 20<sup>th</sup> century was stress
- In 1982 Barry Marshall and Robin Warren theorized the cause was a bacteria, *Helicobacter Pylori*.
- Dr. Marshall drank a broth full of *H. Pylori* and developed gastritis in 5 days
- The two doctors won the Nobel Prize in Medicine in 2005



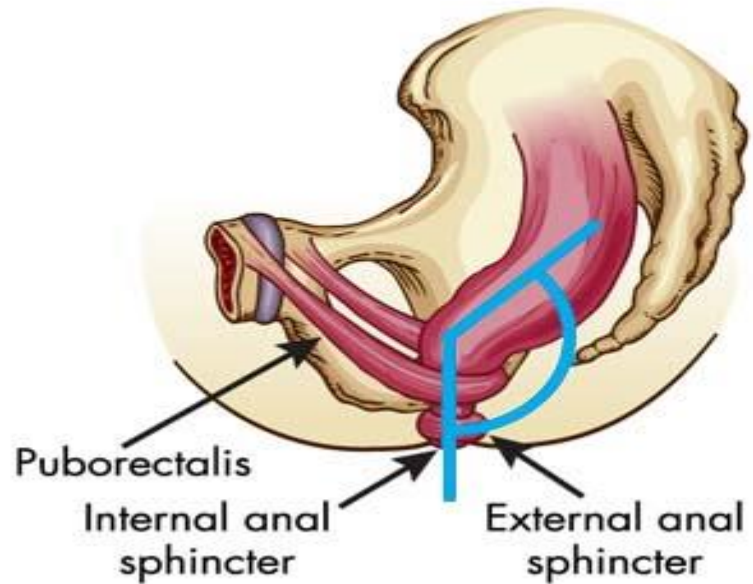
# Floor Toilet



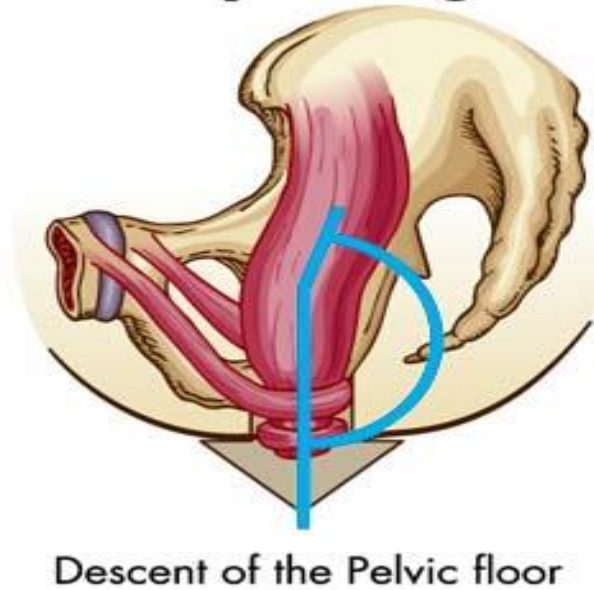


# Anorectal angle

**Sitting**



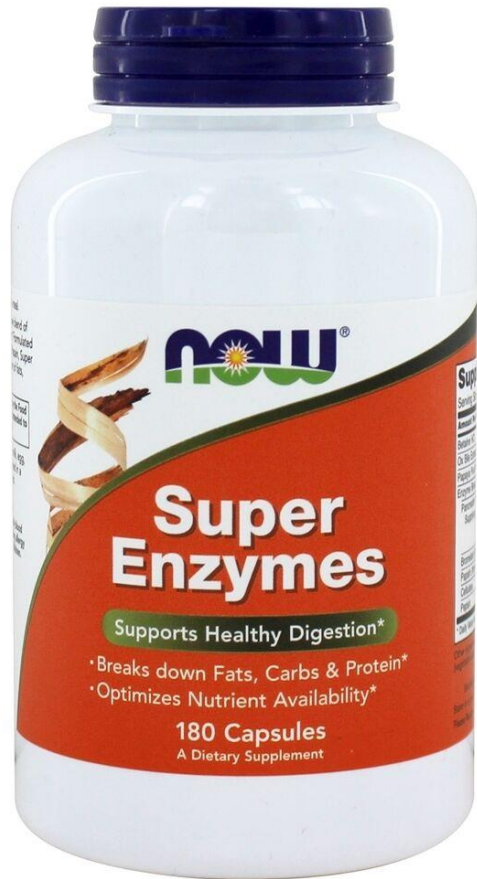
**Squatting**



# Squatty Potty



# Digestive Enzyme Supplement



Probiotics/Enzymes/Digestive

Family owned since 1968.

## Supplement Facts

Serving Size 1 Capsule

Amount Per Serving	
Betaine HCl	200 mg*
Ox Bile Extract (min. 45% Total Cholic Acids)	100 mg*
Papaya Fruit Powder	45 mg*
Enzyme Blend:	200 mg*
Pancreatin 10X	
Supplying: Amylase 37,000 USP Units*	
Protease 37,000 USP Units*	
Lipase 2,960 USP Units*	
Bromelain (from Pineapple)	120 GDU*
Papain (from Papaya)	100,000 FCC PU*
Cellulase	10 FCC CU*
Pepsin	500,000 FCC Pepsin Units*

\* Daily Value not established.

Other ingredients: Gelatin (capsule), Cellulose, Magnesium Stearate (vegetable source) and Silica. Contains sulfites.

NOW FOODS, 395 S. Glen Ellyn Rd.  
Bloomington, IL 60108, USA nowfoods.com

Store in a cool, dry place after opening.  
Please Recycle.

# D-limonene



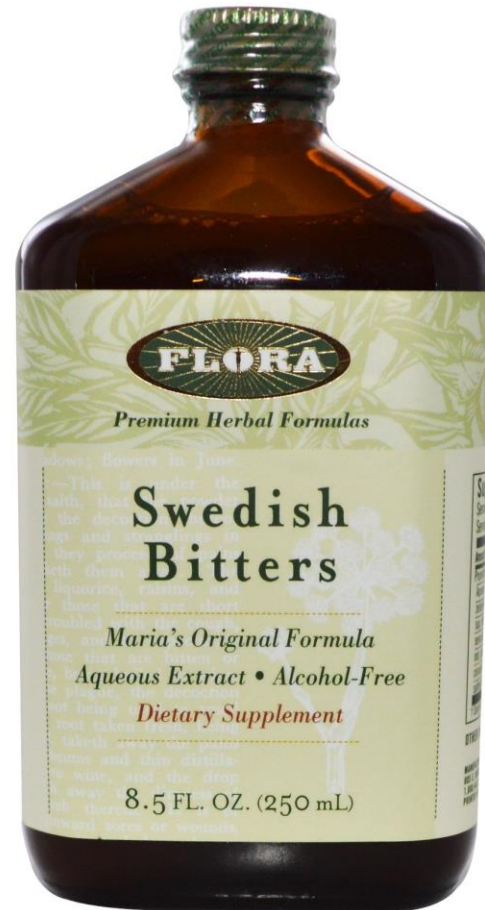
# Stone Root



# Vinegar- diluted with water



# Bitters



# Bitters





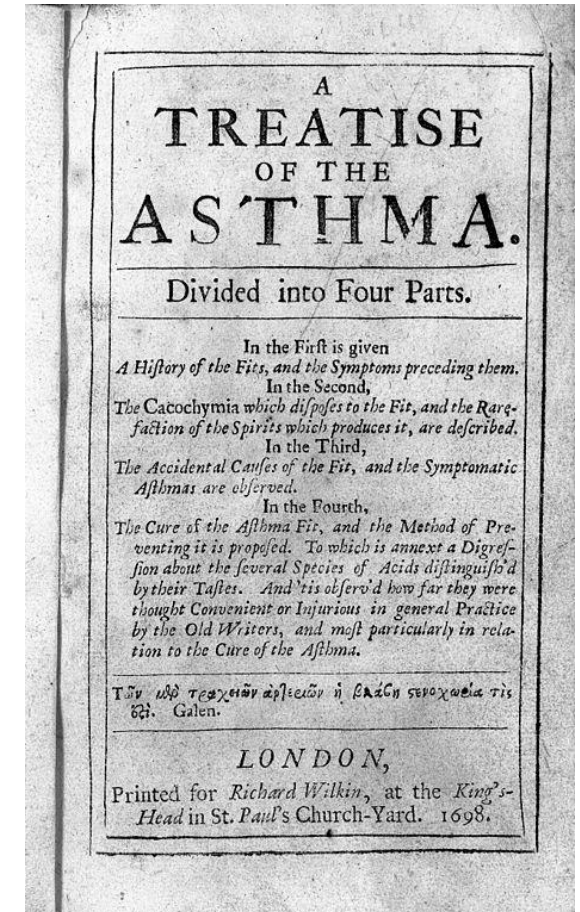
# Bitters and Digestion

- Bitter taste receptors (T2R's)
- Bitter green salad (arugula)
- Pre-meal aperitif (Campari)
- Stimulates digestive juices



# Conclusion

- You are what you can digest and absorb.
- Stomach acid is very important.
- Digestive issues can affect areas outside the gut. (rosacea, depression, asthma, etc.)
- Focus on eating changes first.
- Feed your gut bugs properly.
- Supplementation and medication can also be useful.



# Magnesium

- Involved in over 1,000 enzymatic reactions
- Most important nutrient for detoxification
- Critical to balance with calcium
- “relaxing” mineral
- Magnesium required for chlorophyll production  
(dark greens)
- 200-800 mgs/ daily  
(bowel tolerance)
- Malate, taurate, glycinate, orotate, and chloride are best forms
- Magnesium oxide poorest form
- Skin absorption of magnesium is excellent:  
Epsom salt or magnesium oil



# Epsom Salt

