Cause, Care and Dietary Treatment of SIBO

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www.siboinfo.com

WAPF Convention
November 2014

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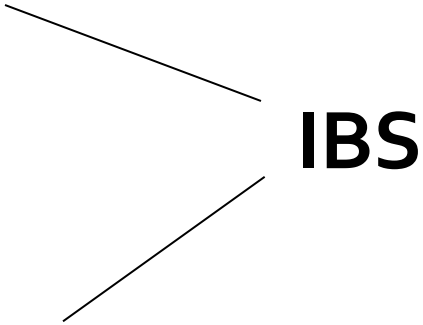
SIBO Symptoms

- **Bloating**/abdominal Gas
  - Belching, flatulence
- Abdominal **Pain**, Cramps
- **Constipation, Diarrhea, both**
- Heartburn
- Nausea
- Leaky Gut Sx=food sensitivities, h/a, joint pain, respiratory sx, skin sx, brain sx…
- Malabsorption - steatorrhea, anemia



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What is SIBO?

- A condition in which abnormally large numbers of bacteria are present in the small intestine, leading to impairment of digestion and absorption

- Bacterial Colonization of the Small Intestine
  - With normal flora, not pathogenic

- Issue = location, location, location

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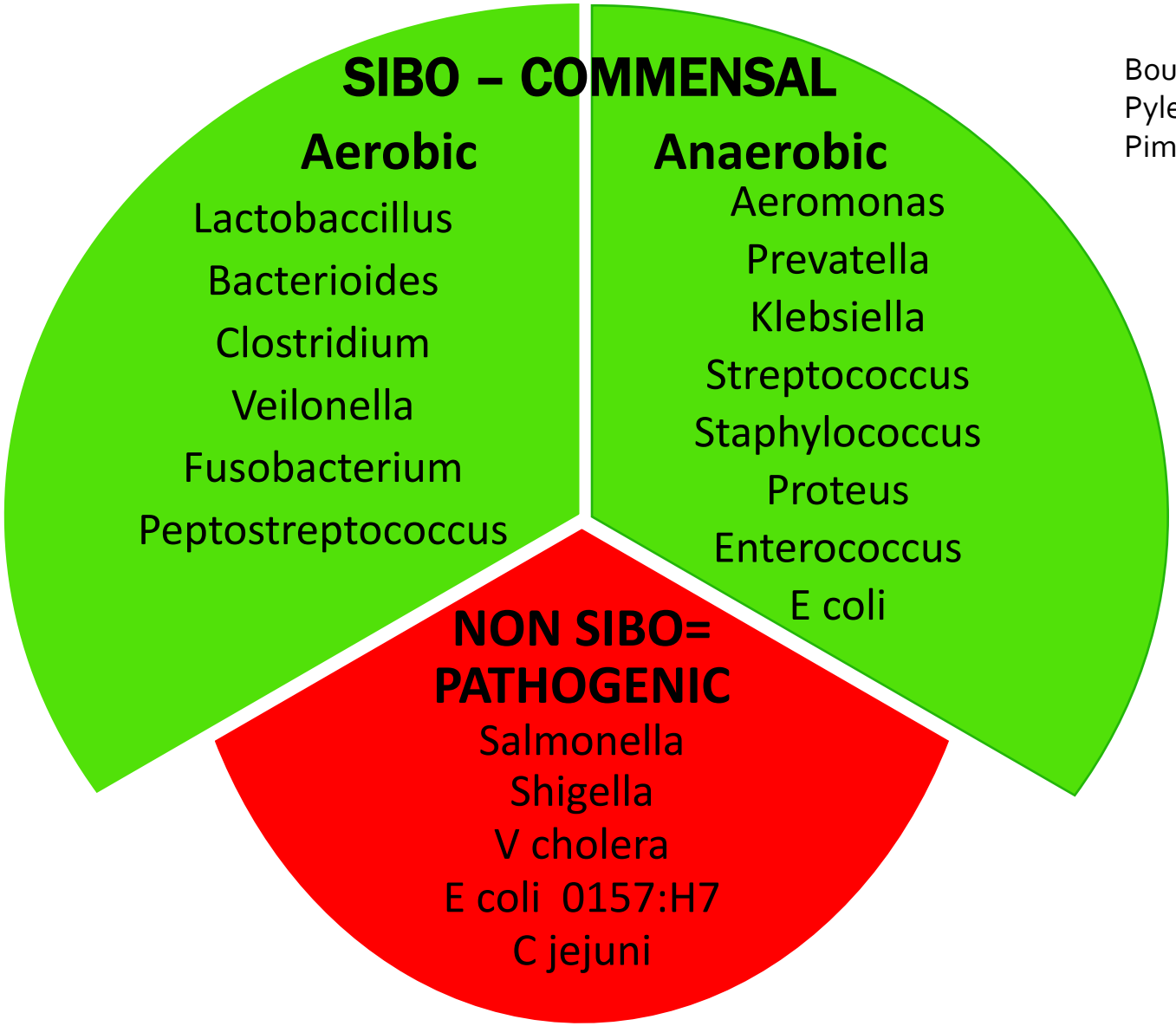
Types of Bacteria



Bouhnik '99
Pyleris '12
Pimentel '14

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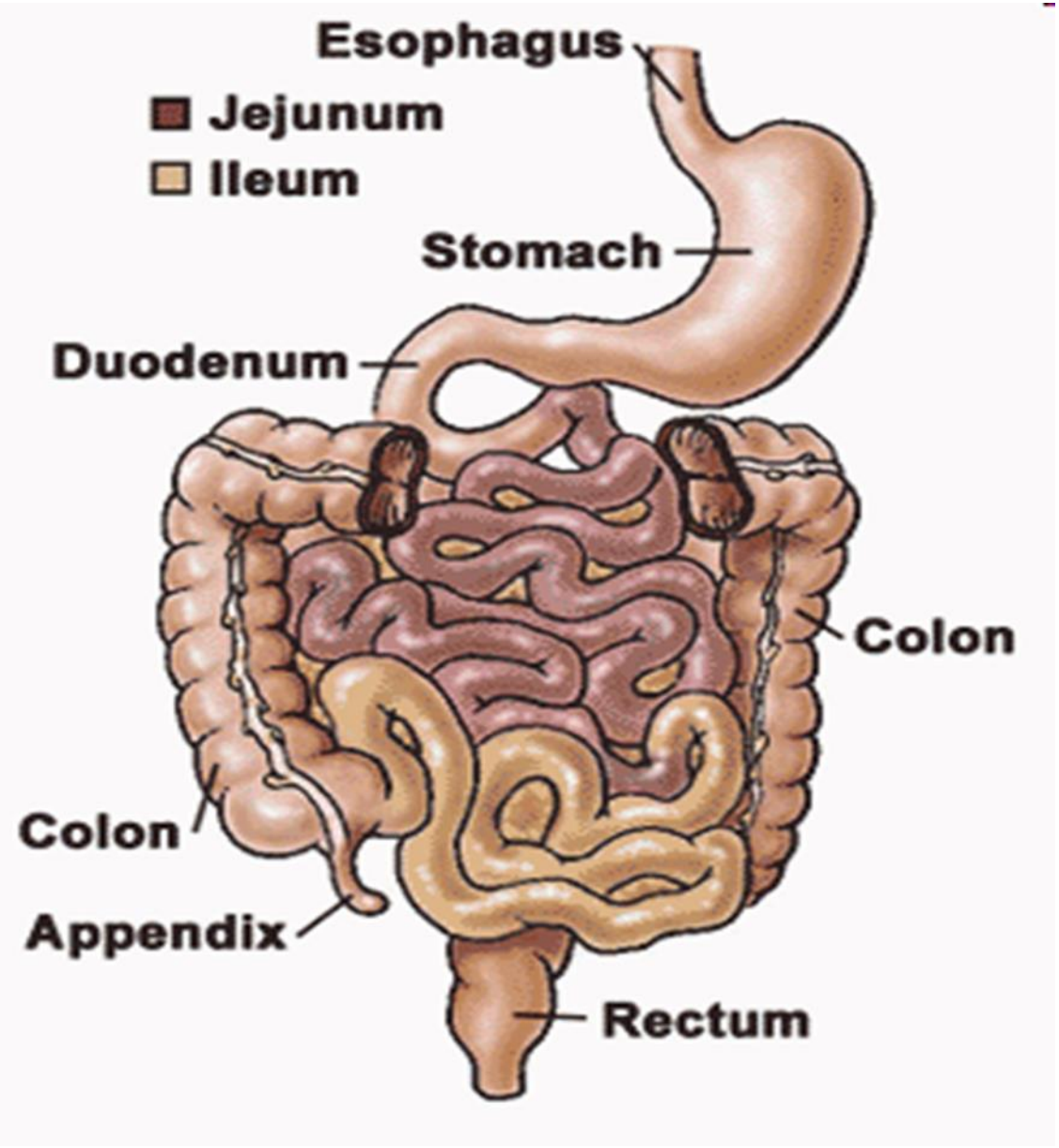
Gastrointestinal Tract



Source:
http://missinglink.ucsf.edu/lm/ids_106_lowergi/lower%20gi/mainpages/smallintestine.htm

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Prevalence: SIBO is Common

- IBS effects 10-20% US pop. 30–60 million
- Not all IBS is SIBO = avg. 60% IBS have SIBO
  - 6-12%, 20-38 million = SIBO (estimate)
- In comparison:
  - 1-2% = Celiac Disease
  - 1.4 mil = Inflammatory Bowel Disease
- Factoring in other Associated Diseases (40+)
  - It's likely the # is higher

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Associated Diseases & Risk Factors

Acne
Acne Rosacea
Acromegaly
Alcohol Consumption (moderate intake)
Anemia*
Atrophic Gastritis
Autism
Celiac Disease/ Tropical Sprue
Chronic Fatigue Syndrome
CLL (Chronic Lymphocytic Leukemia)
Cystic Fibrosis
Diabetes
Diverticulitis
Dyspepsia
Elderly Age
Erosive Esophagitis
Fibromyalgia
Fructose Malabsorption*
Gallstones
Gastroparesis
GERD*
Hepatic Encephalopathy (Minimal)
H pylori Infection
Hypochlorhydria
Hypothyroid/ Hashimoto's Thyroiditis
IBD (Crohn's, Ulcerative Colitis)
IBS*
Interstitial Cystitis
Lactose Intolerance*
Leaky Gut*
Liver Cirrhosis
Lyme
Malabsorption Syndrome
Meds: **Proton Pump Inhibitors**, Opiates
Muscular Dystrophy (myotonic Type 1)
NASH /NAFLD
Obesity
Pancreatitis
Parasitic Infection
Parkinson's
Prostatitis (chronic)
Radiation Enteropathy
Restless Leg Syndrome
Rheumatoid Arthritis
Scleroderma
Surgery: Post-Gastrectomy

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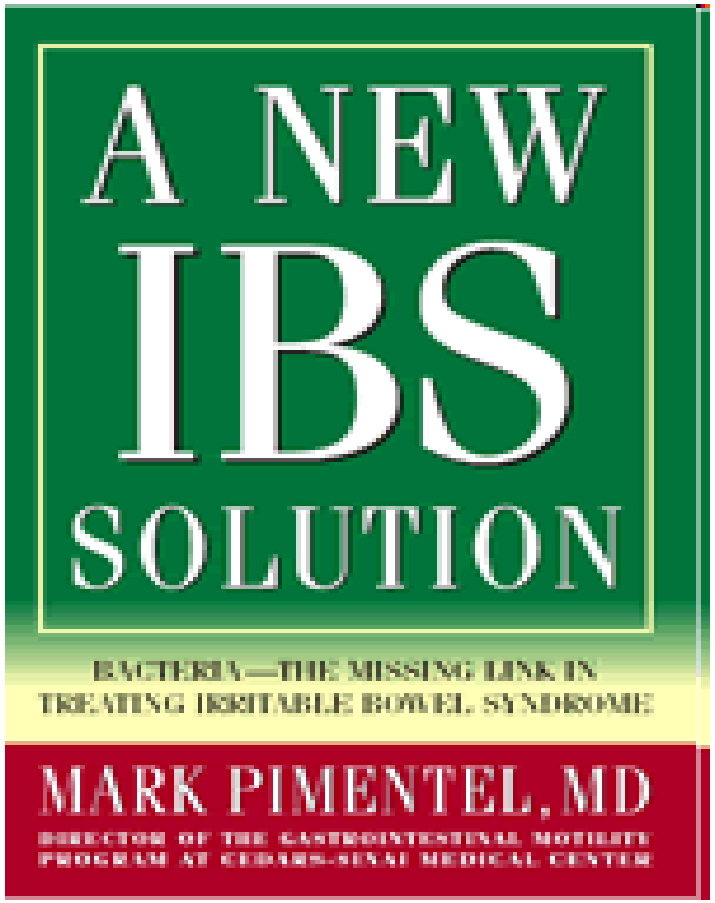
See siboinfo.com for study links

SIBO= Underlying Cause of IBS



- 2000- Pimentel, Chow, Lin
- 84% IBS test+ SIBO
- 75% of those whose breath tests normalized after treatment, had improvement in sx's
- SIBO= consequence of Scleroderma, blind loop

(Pimentel, Am J Gastroenterology 2000, 2003)
(Rees, Gastroenterology 1982)
(Soudah, N Engl J Med. 1991)

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Causes (general)

Anything that allows bacteria to back up or accumulate in the Small Intestine

1. Slowed Motility in the SI (migrating motor complex)
   - Diseases, Opioid Drugs, Surgical/Traumatic nerve damage, Stress
2. Obstruction of the SI
   - Adhesions, Tumors, Strictures, Hernia, Excess Mucus…
3. Non draining pockets/sections of SI
   - SI Diverticulitis, Surgical Blind Loops

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Common Causes of SIBO

1. Food Poisoning (Acute Gastroenteritis)
   - Travelers Diarrhea, Stomach Flu
   - IBS that develops after food poisoning = Post-Infectious IBS
   - PI-IBS is SIBO
   - Food Poisoning decreases MOTILITY by damaging nerve cells
2. Adhesions
   - Scar tissue bands that can occur in or outside SI
   - OBSTRUCTS flow by partially blocking, narrowing or constricting tube

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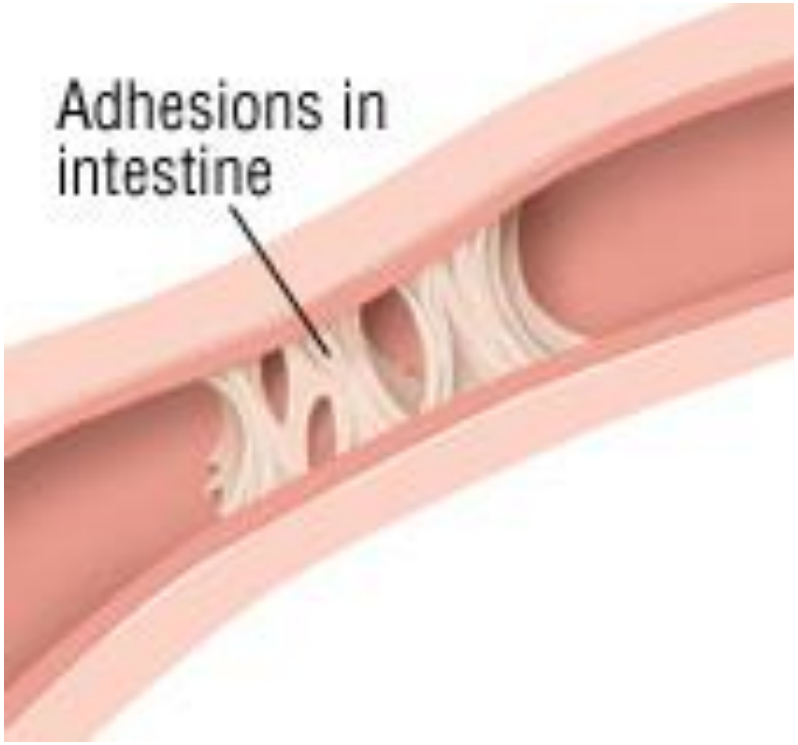
Adhesions



Source: http://www.drugs.com/health-guide/bowel-obstruction.html

Source: http://www.clearpassage.com/what-we-treat/bowel-obstructions/

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Motility: Migrating Motor Complex
"Housecleaning Wave"

(Ohno 2010, Pimentel 2002, Husebye 1995, Vantrappen 1977, Nieuwenhuijs 1998, Roland 2014)

- Strongly propulsive movement that sweeps from stomach to lower small intestine every 90 min
- Occurs during fasting: between meals, overnight
  - Turns off when we eat, or drink caloric beverages
  - Wait 4-5 hours between meals to allow MMC's
- Function: prevent bacterial overgrowth by sweeping bacteria down to large intestine
- SIBO patients have reduced MMC waves

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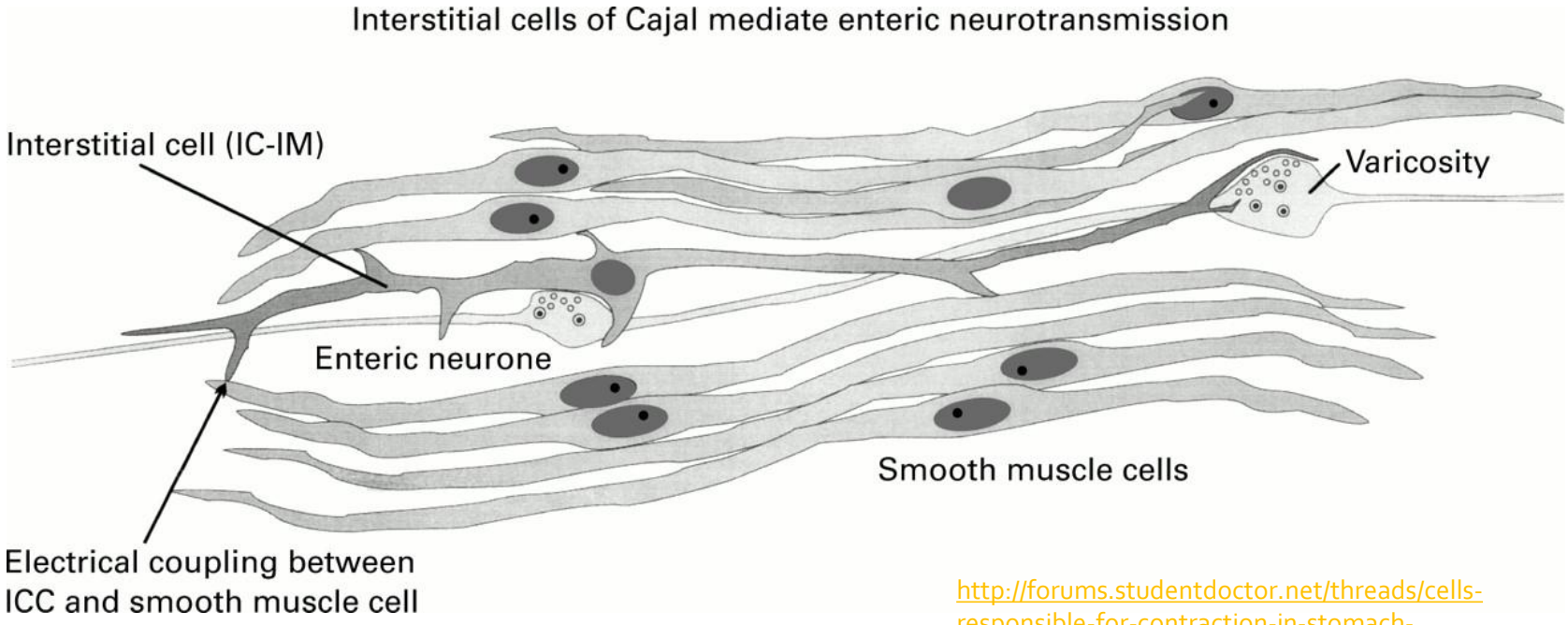
Interstitial Cells of Cajal Control MMC

(Pokkunuri 2012)



http://forums.studentdoctor.net/threads/cells-responsible-for-contraction-in-stomach-intestine.1040323/

- If # ICCs decrease below 0.12/villus, SIBO develops

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How Food Poisoning Causes SIBO

(Pimentel 2008/2011/ACG13/UEG13, Jee 2010, Morales 2011, Shah 2012, Pokkunuri 2012, Porter 2013, Sung 2013)

During food poisoning, pathogenic bacteria secrete Cdt toxin.

Cdt b looks like vinculin protein on ICC nerve cells. Due to mistaken identity, the immune system attacks vinculin along with the Cdt toxin & thus damages the ICC nerve cells.

The ICC damage decreases the number of MMC waves, and allows SIBO to develop.

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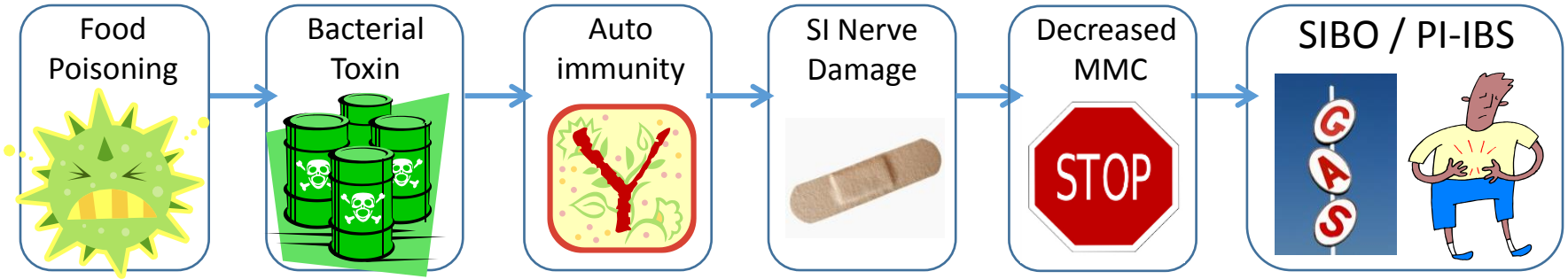
A Simplified Sequence (Pimentel)



C jejuni

CDT b

Vinculin

Interstial Cells Cajal

Stasis

After Pimentel 2013

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Other Causes of SIBO

1. Slowed SI Motility
   - Dz: Diabetes, Hypothyroid, Scleroderma, Lupus
   - Surgical nerve damage
   - Traumatic nerve injury (brain or abdominal, ex car accident)
   - C diff infection (Antibiotic induced diarrhea)
   - Drugs: Opiate Narcotic pain killers
2. Partial Obstruction (blockage)
   - Cancer tumors (pancreas…)
   - Crohn's Strictures
   - Hernia, Volvulus, Intusseption…
   - Cystic Fibrosis

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Relapse is Common

- SIBO will relapse until the underlying cause is treated
- For some the cause can't be fixed
  - Scleroderma: progressive, incurable
- For some it's unknown how to fix it
  - ICC nerve damage from food poisoning
- For some it's not so simple
  - Adhesions: Surgical removal may create more
- Identification: PI-IBS test in development, Barium SI series to "rule out adhesions" (write on order)

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PATHOPHYSIOLOGY

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SIBO Causes Problems

- The SI is not designed for a lot of bacteria
  - LI is the place for bacteria - do good things there

- But by being in the wrong location, bugs:
  1. Eat (ferment) host's food, esp carbs
     - Carbs = favorite food, primary fuel source
  2. Damage SI physical structure and function
     - Leading to maldigestion & malabsorption

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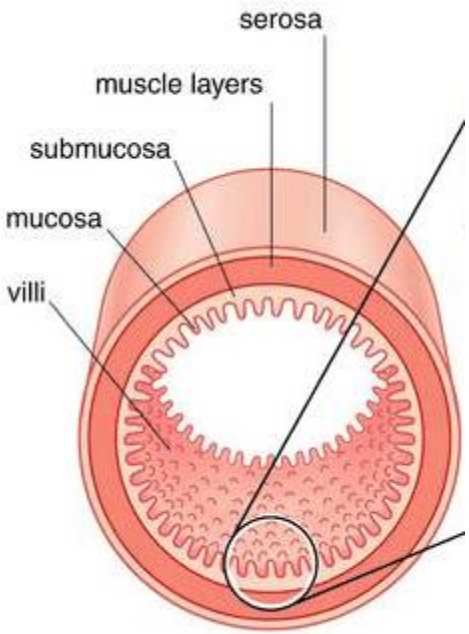
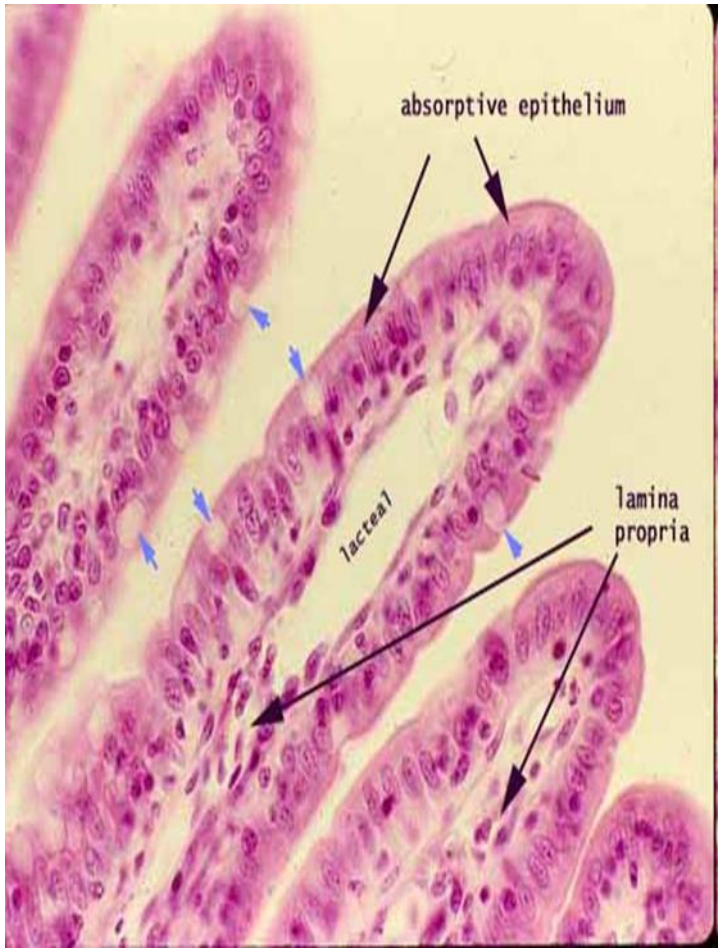
Sources:
http://exerciseandmind.com/category/health-2/
http://www.siumed.edu/~dking2/erg/GI020b.htm
http://163.178.103.176/Fisiologia/general/activ_bas_3/An%20Electron%20microscopic%20view%20of%20membranes.htm

Small Intestine

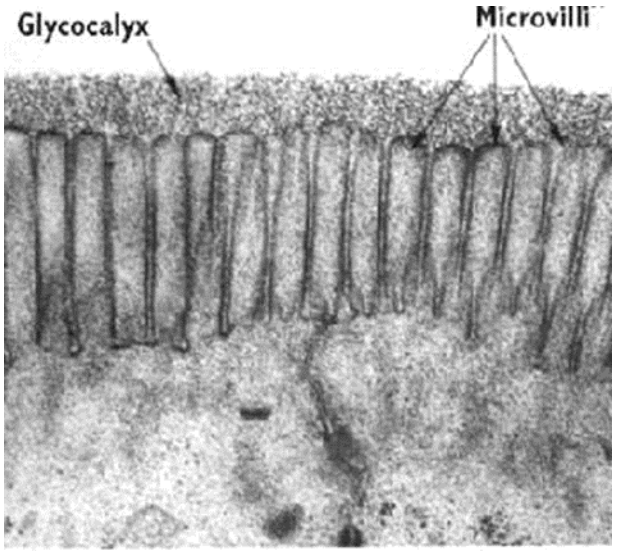


Brush Border
Mucosa
SI Lining

Fingers (Villi)



Hairs (Microvilli)



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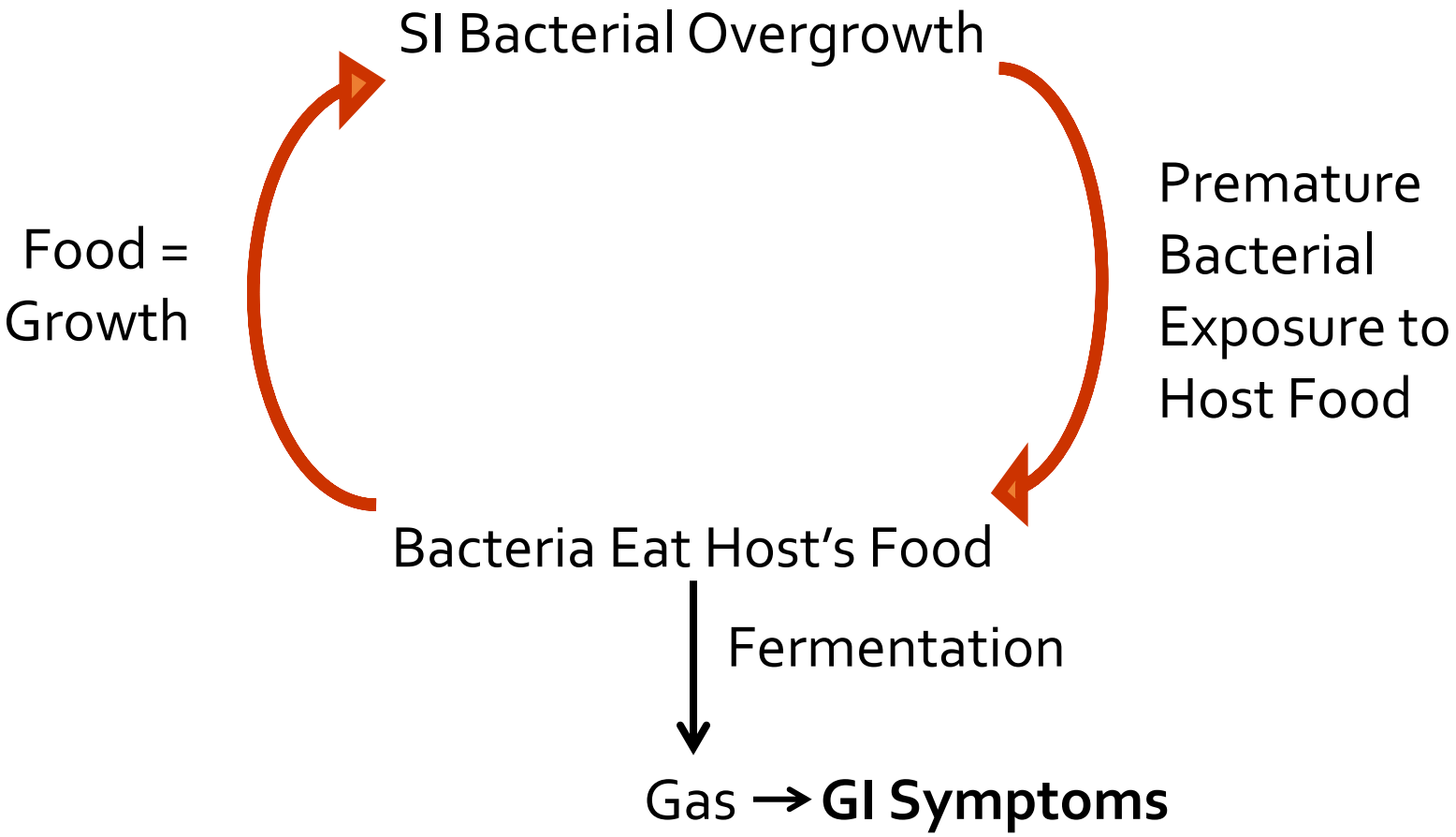
SIBO Pathophysiology #1
Location Fermentation



(O'Mahoney 2010, Cummings 1980)

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Thanks For the Grub. Yum!

Source: http://www.needlework.ru/shop/UID_2106_cookie_monster_embroidery_design.html

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Pardon Me!

Source: https://drawception.com/viewgame/3hPPpSbZAC/cookie-monster-grows-a-moustache/

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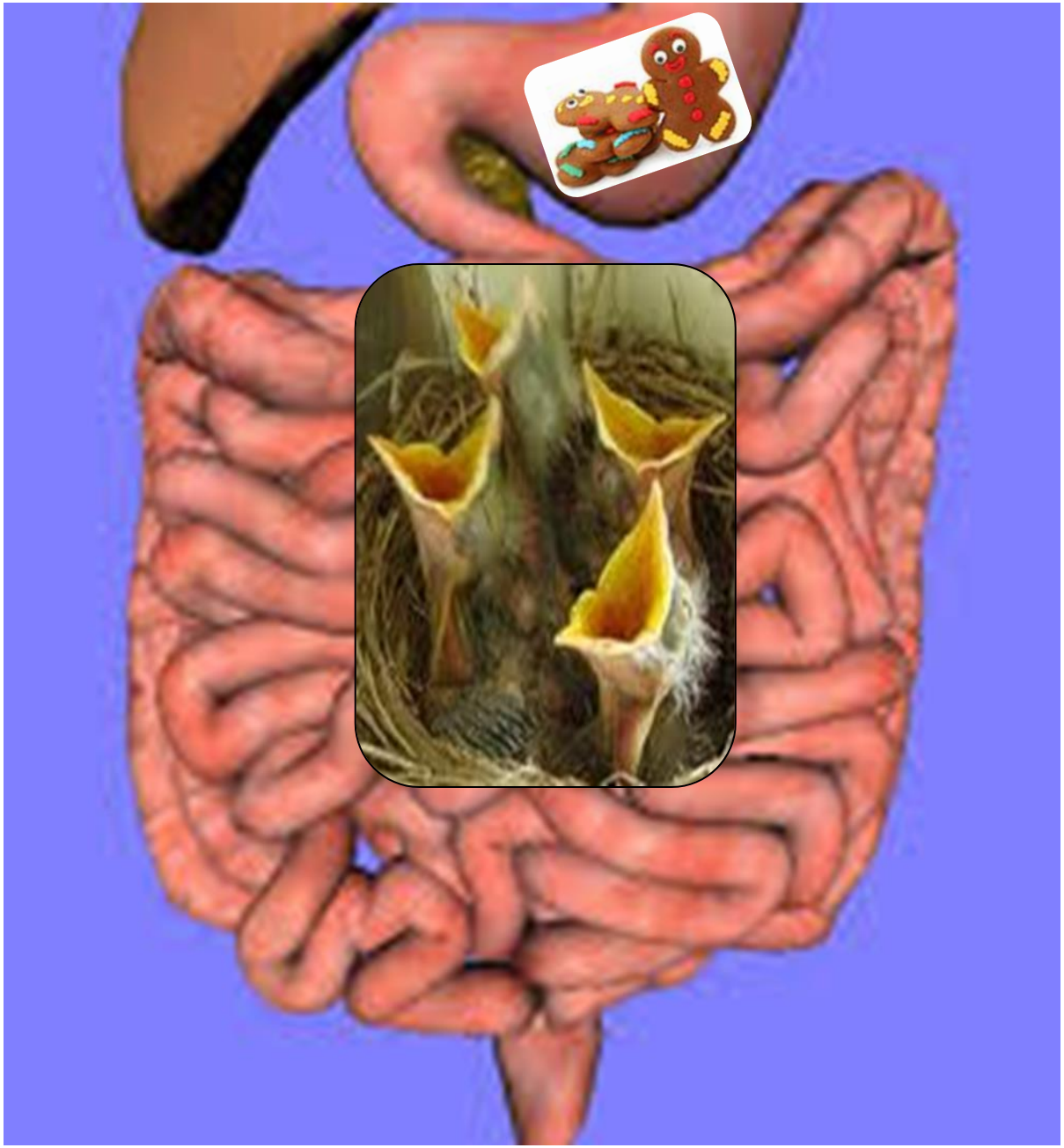

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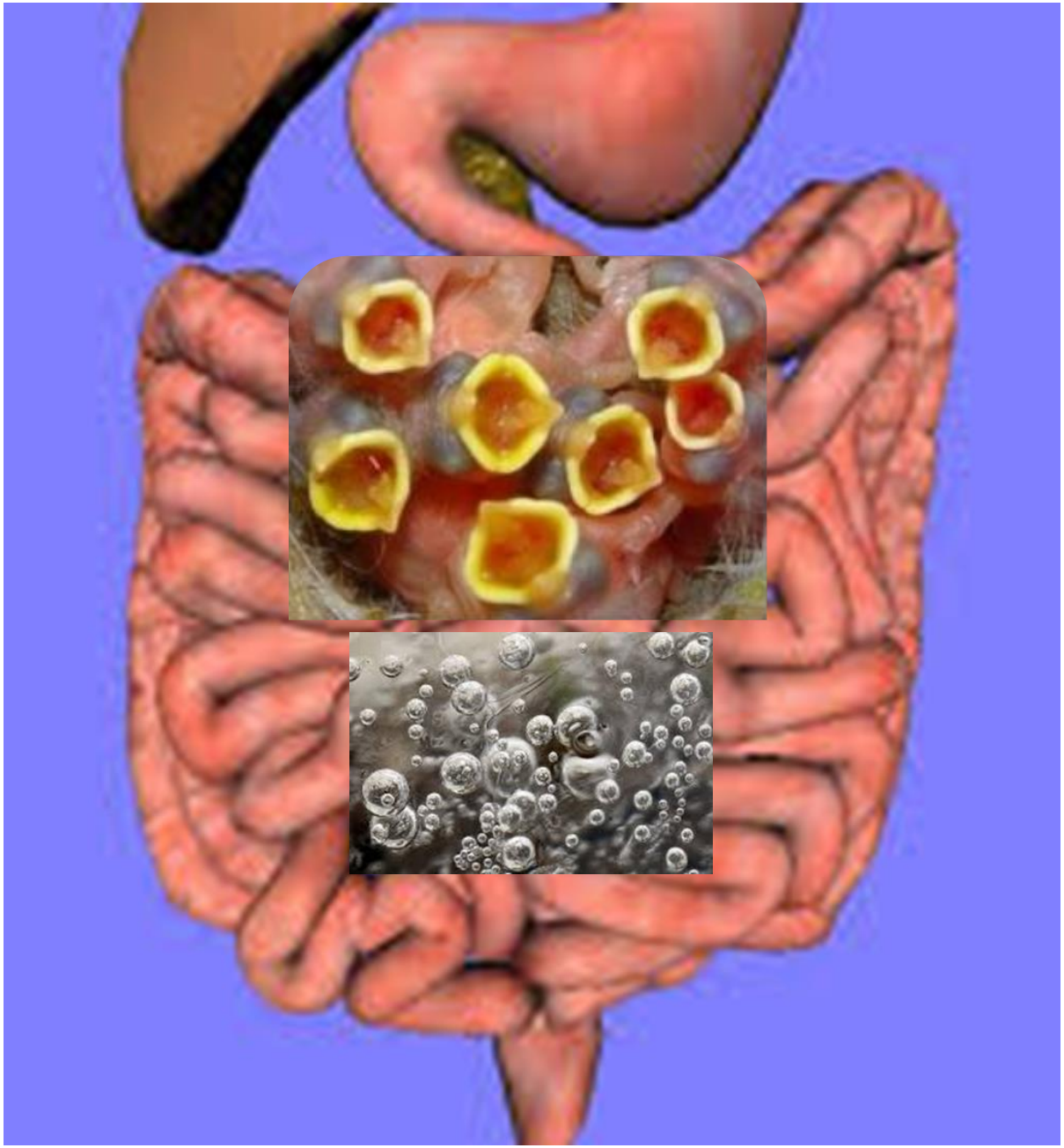

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Bacterial Gas Causes GI Sx

- Hydrogen, Methane = Bacterially produced, not made by humans
- Cause Abdominal Sx of IBS
  - Pain: Intestines sensitive to pressure, muscles contract against gas, Visceral Hypersensitivity
  - Bloating: xs gas swells intestines physically
  - Burping, Farting: excess gas exits via mouth or anus
  - Altered motility
    - Diarrhea ~ Hydrogen
    - Constipation = Methane

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Methane Gas Causes Constipation

(Pimentel, Am J Physiol, 2006)

- Methane = 70% slowing of GI transit (animal)
  - Via Ca channels
- Causes constipation
- Causes gas back pressure: nausea, acid reflux, burping
- Methanobrevebacter smithii = 1° organism making methane in humans
  - Archaea, not bacteria
  - Commensal in 30%+ pop but only when its' overgrown is there enough methane to cause constipation

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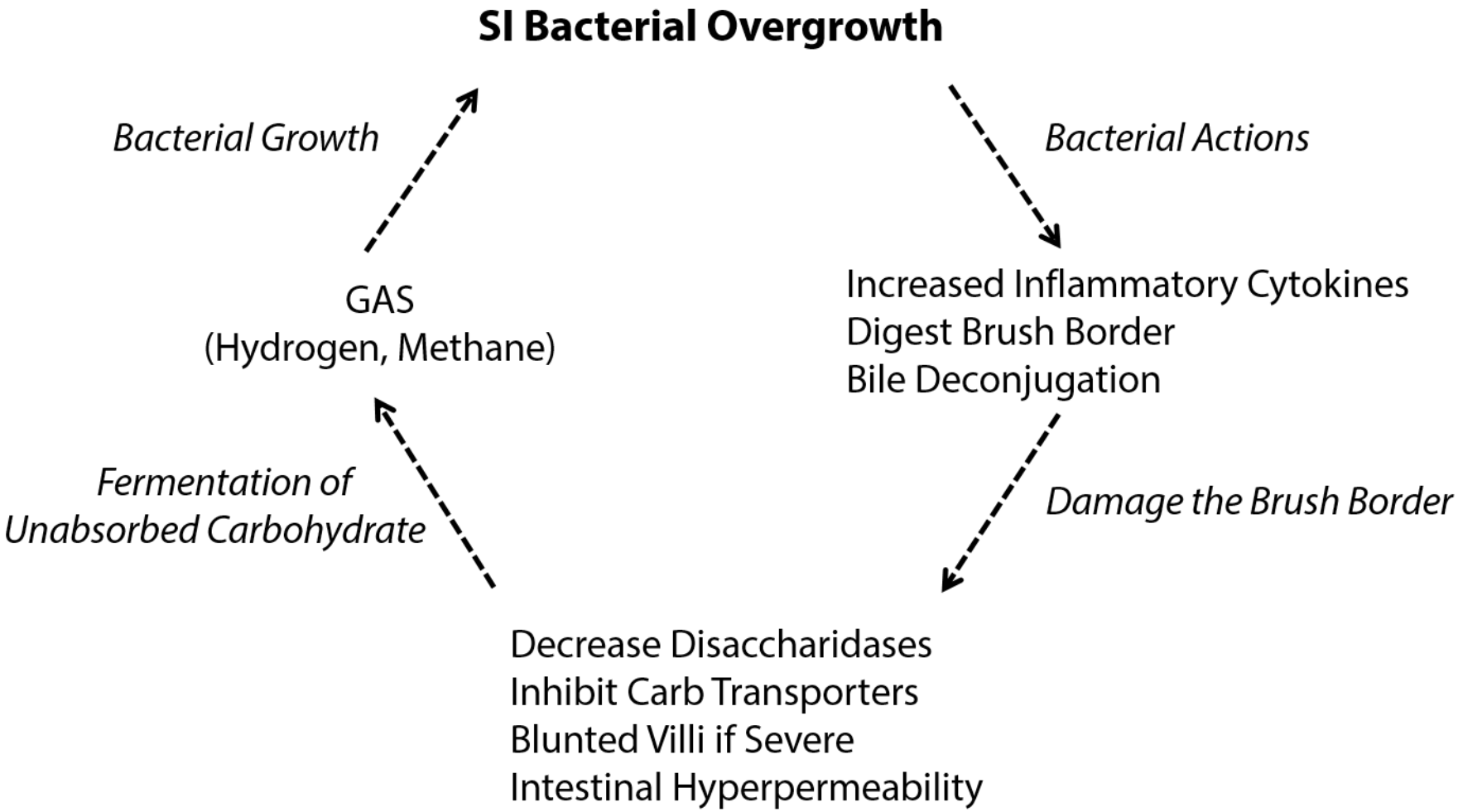
SIBO Pathophysiology #2
Damage



(Riordan 1997, Jonas 1977, Jonas 1978, Prizont 1981, Riepe 1980, Shindo 1998, Tabaqchali 1968, Saltzman 1994, DiBaise 2008, Kaufman 1997, Ament 1972, Sherman 1985, Giannella 1974, Toskes 1975, Riordan 1997, Lauritano 2010, Arrieta 2006, Goebel 2008, O'Mahoney 2010, Lee 2006, Bohm 2013, Gabrielli 2013, Cummings 1980)

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SIBO Causes Carbohydrate Malabsorption

- When CHO's bypass absorption in the Small Intestine & are left in the lumen of the SI & LI
  1. Get **fermented** by bacteria creating **GAS**
  2. CHO's sitting in the intestine have an **osmotic** effect drawing **water** in

- GAS & water trigger symptoms
  - Bloating, constipation/diarrhea, pain, flatulence, belching, nausea, GERD…

- 1° SIBO symptoms are due to Carbohydrate Malabsorption
  - This is why all SIBO Diets target & reduce carbs

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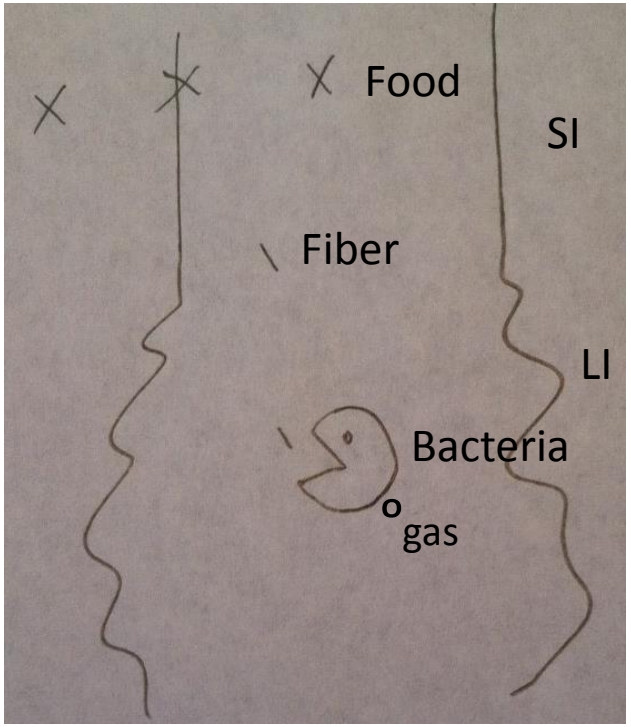
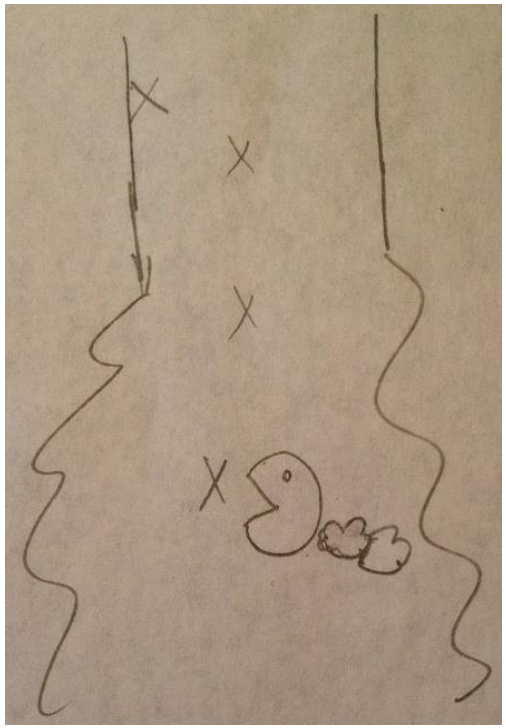
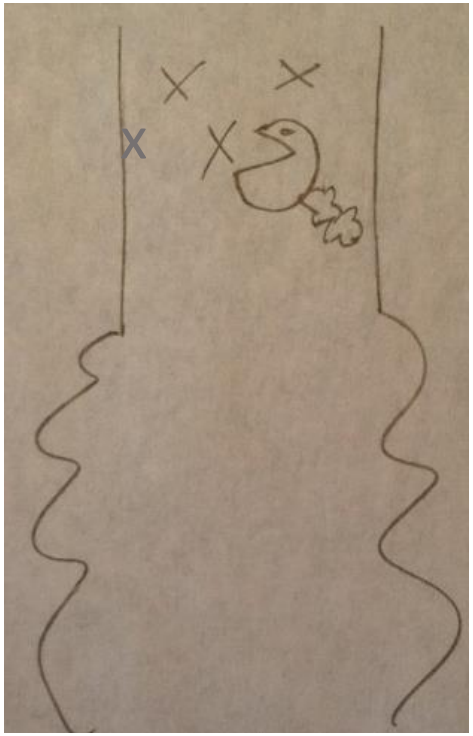
Normal Absorption



Standard CHO Malabsorption



SIBO Malabsorption



Water influx not pictured

Source:

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Carbohydrates=Saccharides=Sugars
Classified by Length

- Monosaccharides (glucose/fructose/galactose). Mono=1

- Disaccharides (sucrose/lactose). Di=2

- Oligosaccharides (FOS/GOS/MOS). Oligo= few, 3-10

- Polysaccharides (starch/fiber). Poly= many, 10++

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Fiber

(Slavin 2012, Murphy 2008, Guillon 2000)

- Definition: Indigestible to humans
  - But digestible to bacteria = Prebiotic
    1. Only bacteria make enzymes to break the bonds
       - Ex: Cellulase > cellulose
       - Ex: α-galactosidase (Beano) > GOS in beans
    2. Bonds "resist" our enzymes (ex. structurally inaccessible- enzymes can't reach bonds)
       - Ex: Resistant starch
- Fiber worsens SIBO by feeding bact > gas> sx
- Problem = Fiber is in all plant foods
  - Grains, beans, nuts, seeds, vegetables, fruits
- Fiber includes both long & short chains (polysaccharides & oligosaccharides)

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Fiber (Prebiotic)

(Slavin 2012, Murphy 2008, Guillon 2000)

Long Chain

Soluble Fiber
Pectin
Inulin
Gums: guar, locust xanthum, mastic, arabic/acacia
Beta glucan
Alginate, Carrageenan
Agar Agar
Glucomannon/Konjac
Arabinogalactan

Insoluble Fiber
Cellulose
Hemicellulose
Lectin

Short Chain

Oligosaccharide Fiber
FOS - Fructoligosaccharide
MOS – Mannoligosaccharide
GOS – Galactoligosaccharide
Stachyose, Raffinose

Resistant Starch
I physically inaccessible (cell walls)
II structurally inaccessible (raw & amylose)
III cooked & cooled (retrograded)
IV chemical modification

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Fiber (Prebiotic) Food Sources

(Slavin 2012, Murphy 2008, Guillon 2000, Harvard PDF 2004, Tropical Traditions Label)

Long Chain

Soluble Fiber
Beans
Oat Bran
Barley
Citrus Fruit
Psyllium
Flaxseed

Insoluble Fiber
Wheat Bran
Beans
Coconut
Raspberries
Some Vegetables
Barley
Flaxseed

Short Chain

Oligosaccharide Fiber
FOS – Jerusalem Artichoke, Garlic, Onion, Wheat
GOS – Beans

Resistant Starch
I Whole Grains, Seeds
II Raw Potato/Grains, Unripe Banana, Some Beans, High Amylose Rice/Corn
III Reheated Potato/Bread, Potato/Corn Chips, Starch Powder
IV Created in Lab

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Key Point

In the case of SIBO, even carbs that we should be able to digest & absorb, can be malabsorbed

- Due to 1. location fermentation 2. damage
  - Starch (polysaccharide)
    Grains & Starchy Tubers
  - Lactose, Sucrose (disaccharides)
    Milk, Table sugar
  - Fructose (monosaccharide)
    Fruit, HFCS, Agave, certain varietals of Honey
- Degree to which this happens is individually based
- This is why SIBO Diets target & reduce these carbs too

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2° Lactose Malabsorption is an Ex of Carbohydrate Malabsorption (Lomer 2008)

- 1° lactose malabsorption is Genetic lact*ase* enzyme deficiency
  1. Congenital (born without lactase)
     - Rare
  2. "Lactase Non-Persistence" (loss of lactase enzyme after weaning)
     - Common
- 2° lactose mal is Acquired lact*ase* enzyme deficiency in the Lactase Persistent (disease)
  - Ex: celiac, food poisoning, radiation, SIBO…

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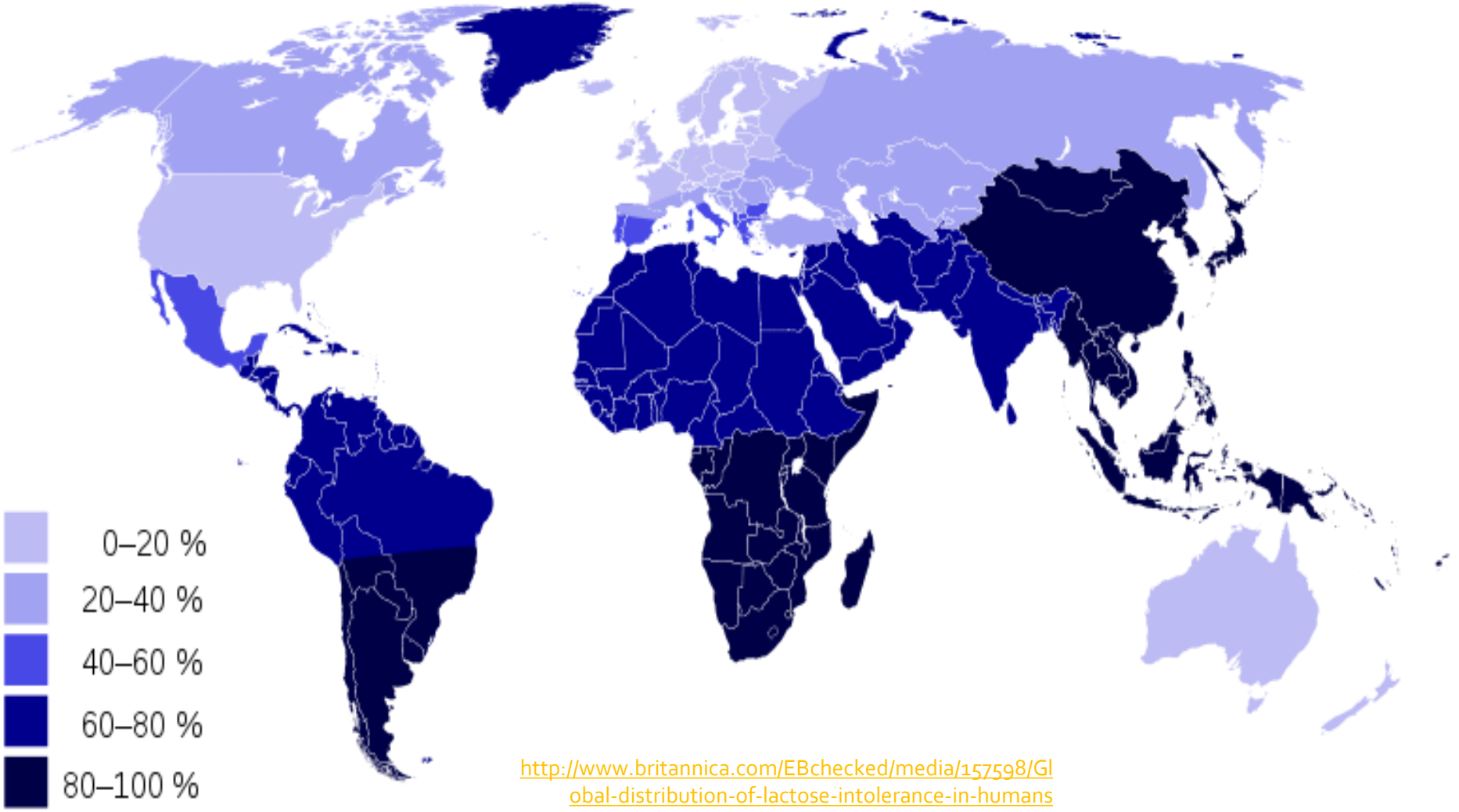
Prevalence of Lactose Intolerance



http://www.britannica.com/EBchecked/media/157598/Global-distribution-of-lactose-intolerance-in-humans

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Lactose Malabsorption & SIBO

(Ruchkina 2013, Nucera 2005, Almeida 2008, Zhao 2010, Pimentel 2003, Lomer 2008)

- SIBO is a common cause of 2° Lc Mal
  - Damage to lactase enzyme = Enzyme deficiency
  - Location Fermentation = bact eat it b4 host can
- Reversible
  - If there is no genetic lactase deficiency (lactase non-persistence) it can normalize when SIBO heals
- Constipation can be sx of Lactose Malabsorption due to methane gas

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Lactose Free Dairy Foods

- Homemade 24 hr yogurt /sour cream
- Aged Cheese x 30 days+
  - Not Fresh (cheve, mozzarella, getost, feta, ricotta)
- Dry Curd Cottage Cheese
- Ghee/Butter
- Lact*ase* enzyme treated cream in small amts
- Commercial lactose-free dairy
  - Milk, half and half, yogurt, sour cream…
  - Check for quality, pectin/gums

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How to Make 24 Hour Yogurt

- Heat milk 180°-185°, stirring occasionally
  - Use a candy thermometer – Raw = heat to 110°
- Cool milk to 100-110° in a sink of ice water
- Mix a little milk with starter in a separate bowl (packaged starter or ½ cup live yogurt to a quart milk)
- Add back to pot, mix well & pour into Yogurt maker
- Allow to ferment at 100-110° x 24-30 hours
- Transfer to fridge to cool and firm up

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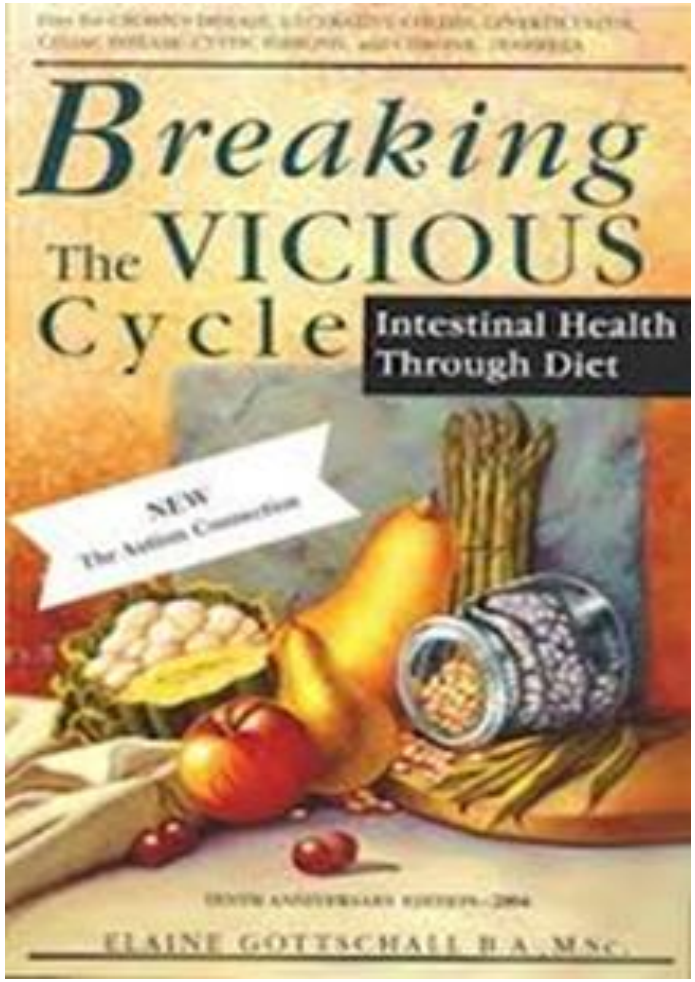
Lactose Free Dairy Points

- SCD advised L-F Dairy
  - Nutrition, calories, probiotics (HM Yogurt)
- My experience = 75-80% with SIBO tolerate & do better with it
  - Increase energy
  - Stabilize weight loss
  - Helps digestion (yogurt)
  - Increases food pleasure
- 20-25% can't tolerate dairy = avoid it



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Fructose Malabsorption

(Gibson 2006 & 2013, Jones 2011, Latulippe 2011, Nucera 2005)

1. Occurs with & effected by polyols & other CHOs
2. Low absorptive capacity of fructose transporter
   - Genetic: wide individual variation <5g - >50g: some absorb fructose very poorly; most tolerate 15g
   - Age: absorption increases w/age to adulthood: infants and toddlers absorb fructose very poorly
3. Overconsumption
   - 20% increase in food supply: fruit juic rn fruits, agave syrup, high fructose corr 5

4. Disease – rapid transit, SIBO

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Fructose Malabsorption and SIBO

(Gibson 2006 & 2013, Jones 2011, Latulippe 2011, Nucera 2005)

- SIBO can cause Fructose Malabsorption
  - Damage to CHO transporter Glut 5 = Transporter deficiency
  - Location Fermentation = bact eat it before host can
- May normalize when SIBO heals
- Fructose well absorbed with glucose 1:1 ratio
  - By Glut 2, a backup transporter
  - Ex: Sucrose and clover/raspberry/citrus Honey
    - Not all varietals of Honey are high fructose and therefore are tolerated by fructose malabsorbers

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TESTING

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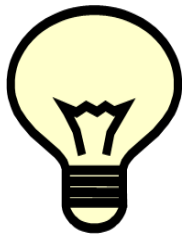
Key Indicators



- Antibiotics improved GI symptoms (sx)
- Prebiotics (in probiotics) worsen GI sx
- Fiber worsens constipation (and other GI sx)
- Carbs worsen GI sx (grains/veg/beans)
- GI sx start after opiate use (dt surgery)
- Chronic low ferritin with no other cause
- Gluten-free diet fails to improve Celiac pt
- Pancreas obscured by gas bubble on CT

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Testing
Lactulose Breath Test (LBT)

- Tests hydrogen and methane gas produced by bacteria after a prebiotic drink of lactulose, over 2-3 hrs
- Timing reflects the location:
  - SI=1st 2 hrs, LI=3rd hr
- Performed at home with mail-in kits or in a facility with a machine (lab/hospital/office)
- Be sure methane is being tested
- See siboinfo.com for Testing Resources

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TREATMENT

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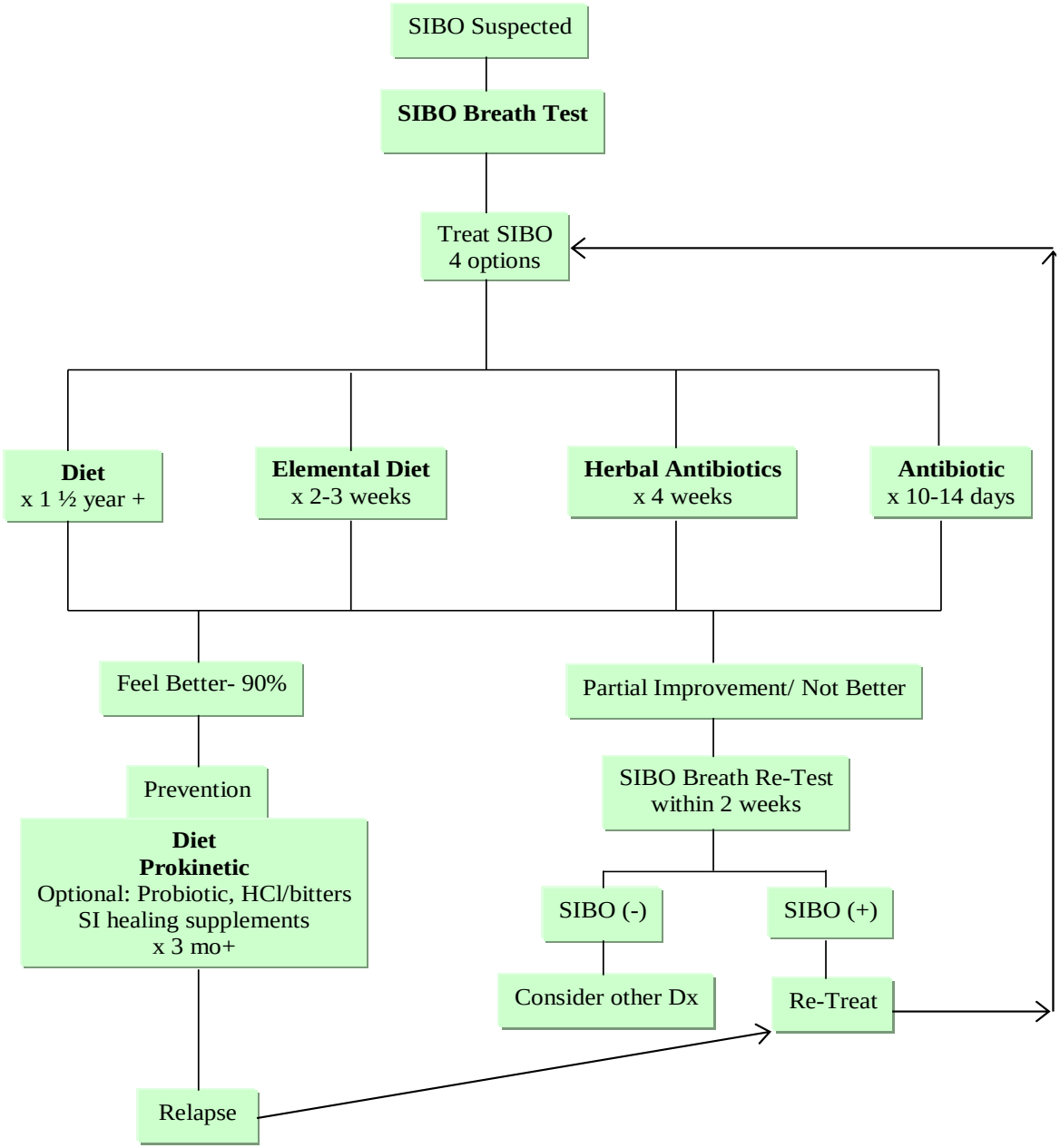
SIBO Treatment Protocol

Variation of the Cedars-Sinai Protocol (Pimentel 2006)

Drs Siebecker & Sandberg-Lewis (2010)



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Key SIBO Tx Points for Success

- Methodical approach: Proper Testing and Retesting to assess results
- Successive Treatment Rounds needed: when gas 45+
- Double Abx Therapy or high dose Allicin needed for methane/constipation cases
- Both Prokinetic and Diet for prevention
- Diet must be customized to the individual through their own trial and error over time

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DIET

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Why Use Diet?

1. Prevention (along with prokinetic): essential
2. As a stand alone treatment
   - In cases where symptomatic relief is significant and the diet is well tolerated
3. Manage symptoms while other treatment is in progress
   - If using Abx/HAbx: treatment can take time to achieve symptomatic relief if gas is high
4. Decrease extra-intestinal symptoms & improve overall health

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Benefits of Diet Beyond GI

- Weight Loss (not a benefit if low/under weight)
- Stabilization of blood sugar (high & low), stop sugar cravings
- Decrease chronic infection and inflammation
  - arthritis, chronic gingivitis
- Improved immunity
  - decreased seasonal colds/flu/allergies
- Improved skin, mood, sleep, energy and overall well-being
- Removes ‘obstacles to cure’, repairs the gut, tx’s other pt complaints

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How Much Does Diet Help SIBO?

(SIBO Center 2011-1014, Ong 2010, Staudacher 2011, Gibson 2010)

- Symptoms: 60-100%, clinically
  - Remarkable
- No studies on Diet in SIBO yet
- But - studies on IBS using Low FODMAP Diet
  - Significant decrease in gas level & symptoms
  - ↓ pain, bloating, flatus, nausea, heartburn, lethargy (BM's weren't tracked)
  - High Fodmap Diet induces sx in IBS, Low Fodmap Diet reduces sx in IBS

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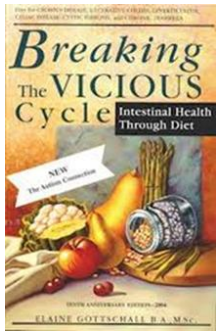
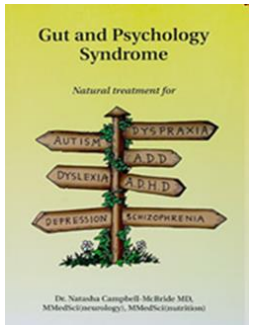
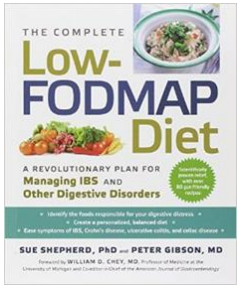
SIBO Diets



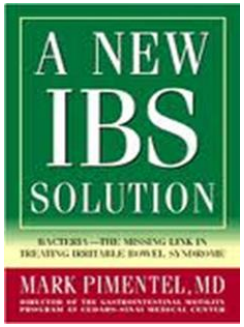
Specific Carbohydrate Diet (SCD) (Haas/Gottschall)



Gut and Psychology Syndrome Diet (GAPS) (Campbell-McBride)



Low FODMAP Diet (LFD) (Shepherd/Gibson)



Cedars-Sinai Low Fermentation Diet (C-SD) (Pimentel)

SIBO Specific Diet (SSD) (Siebecker)

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The Diets - Key Features

- Common to all
  - Allow Protein and Fats
  - No Lactose
  - No Sugar Alcohols (Polyols), No Sucralose

  - Manipulate carbohydrates in different ways

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SCD vs LFD: Saccharides Targeted

- SCD targets polysac starch and fiber = grain, bean and starchy tuber free
  - LFD doesn't=some grains/beans & all starchy tubers allowed
- LFD targets oligosac FOS/GOS = high FOS/GOS plant food free. But allows low FOS/GOS plant foods
  - SCD only eliminates high OS foods it knew about
    - Allows all veg (except starchy tubers), fruits, nuts
  - LFD is gluten free because gluten grains are high in FOS
- SCD targets both disac's lactose & sucrose
  - LFD only targets lactose; Sucrose allowed
- LFD targets monosac fructose
  - SCD doesn't

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The Diets - Continued

- Raw Food - SCD avoids, LFD doesn't
- SSD - combo SCD, LFD and my clinical input
  - Best sx relief, but most restricted
  - Only one designed specifically for active SIBO
- GAPS - often needs modification for SIBO
  - Onion, avocado and broth in Intro often aggravate
  - Raw cultured veg may aggravate
- C-SD - designed for SIBO prevention after tx
  - Targets polysac fiber = no beans or whole grains
  - Allows starchy tubers and white flour/rice/sugar

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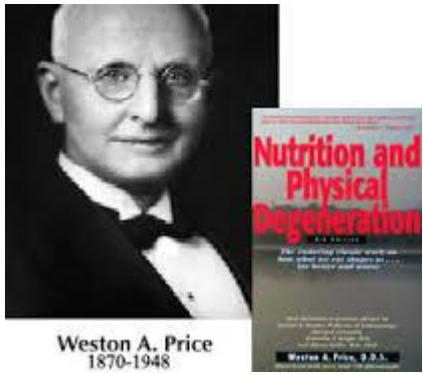
Cedars Sinai Diet and Starch

- Ouch! How could "Displacing Foods of Modern Commerce" help SIBO?
  - Low fiber
  - Clinically - it works
  - White sugar- no GI sx in many
  - White flour/rice = starch



Weston A. Price
1870-1948

- Starch
  - Ok for many w/SIBO: absorbs before bact eat it
  - Helps: Weight gain, Malnutrition, Carbohydrate deficiency, Food Pleasure
  - Options: White Flour/Rice, skinless White Potato
  - White Rice/Potato= WAPF friendly (White Rice- see Fallon/Enig Thailand 2000 & Inside Japan 2000 & debate:Letters, Winter 2001)

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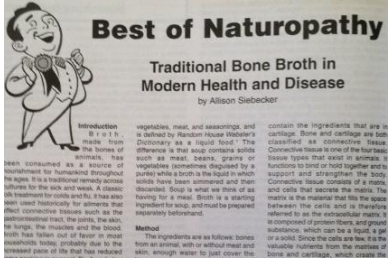
Bone Broth


Best of Naturopathy

Traditional Bone Broth in Modern Health and Disease

by Allison Siebecker

- Many with SIBO don't tolerate bone broth
  - But some do
- Contains GAGS (glycosaminoglycans)=Mucopolysaccharides
  - Polysaccharides are fermentable by bacteria
  - It's the Cartilage, attached to bones, that has GAG'S, not the bones themselves. Try meat only or marrow-bone broth (w/out cartilage)
  - Ribs, with all their cartilage, can be a very aggravating food for SIBO
- Mucopolysaccharides famous membrane healers
  - Aloe, licorice, slippery elm, marshmallow, comfrey

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Non-Mucilaginous Brush Border Healing Supplements

- Colostrum: 5-10g/d x 6 wks
  - Epithelial Growth Factors - close leaky gut
  - Decrease inflammation & infection
- Zinc Carnosine: 75-150 mg qd (cofactor for Vit A)
- L-Glutamine: up to 3g/d (start low) (SI cell fuel)
- Vits A & D & Fish Oil (can take as cod liver oil)
- Glutathione (or NAC precursor): label dosage
- Turmeric, Resveratrol: 3g/d x 1-2 wk, then label dosage long term (down regulates NF-KB inflammatory pathway)

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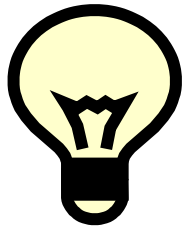
Diet - Which One?

- Pick one and customize as needed
- Diet must be customized to the individual through their own trial & error
  - There's no one diet that is perfect for anyone
  - There's no test to find one's perfect diet



- Key SIBO principle: all CHO could aggravate
  - Find which CHO by trial & error/elimination & challenge
- Diet Success = average 75%. 90% with SSD
  - Phenomenal!

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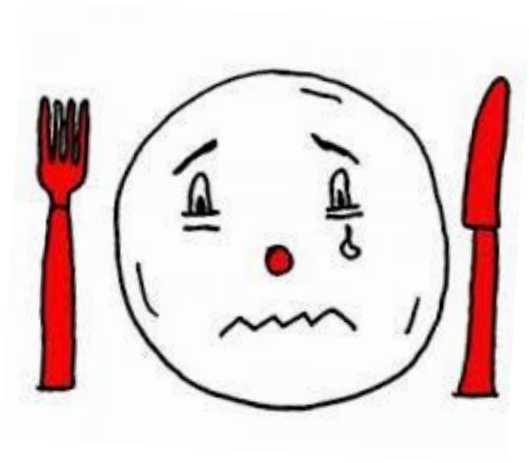
Diet Problem

Attempts to reduce SIBO symptoms with dietary modifications often lead to more and more food restrictions, feelings of deprivation, loss of food pleasure, excessive weight loss and at worst, outright malnutrition.



Source: http://pilladvised.com/2010/01/the-standard-american-diet-sad/

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When Diet Isn't Enough to Tx SIBO

1. Diet isn't giving adequate symptomatic relief
   - Diet isn't working, even when restricted & tweaked
   - "plateaued": helped at first but no more progress
2. Diet needs to be severely restricted to obtain adequate symptom relief, causing malnourishment &/or unhappiness
   - "5 foods": this is no way to live
3. Diet is working but can't go off it even a tiny bit, or get symptoms
   - Want some leeway. Unhappy with their diet.
   - SIBO is still there, just controlled by diet and they want it gone

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Leaky Gut

- When cells or tight junctions between cells open up, allowing unintended items through
  - Partially digested food particles
  - Bacteria and bacterial toxins, viruses, yeast, parasites, metabolites and acids
  - “Antigens”
- Leads to immune reactions and thus symptoms anywhere inside the body
  - Systemic sx’s (h/a, skin, respiratory, brain, joint…)

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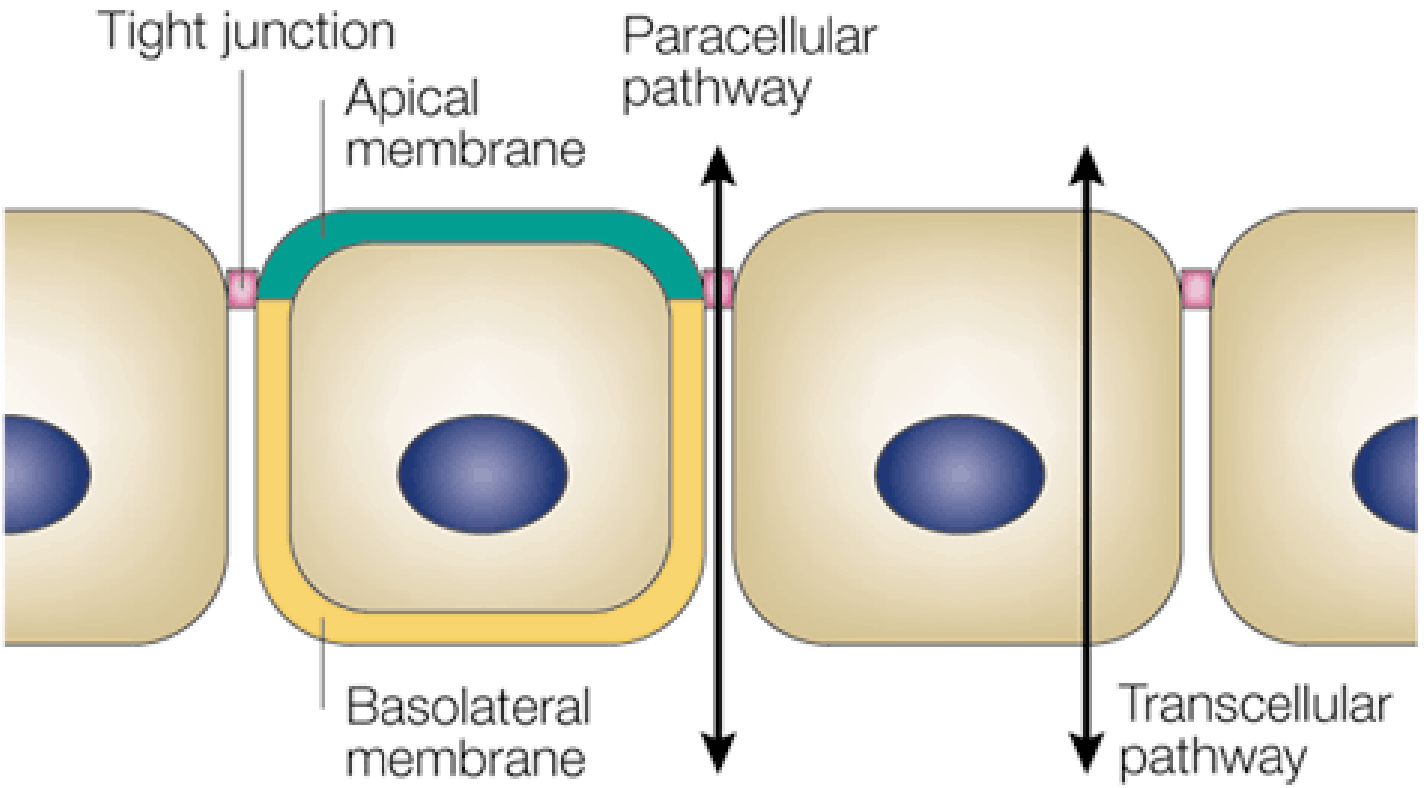
Paracellular and Transcellular Leaky Gut



Nature Reviews | Molecular Cell Biology

Source: http://www.nature.com/nrm/journal/v2/n4/box/nrm0401_285a_BX1.html

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SIBO & Leaky Gut

(Riordan 1997, Lauritano 2010)

- SIBO causes leaky gut in half of patients
  - 50% & 55% leaky gut in SIBO
  - Not everyone with SIBO has leaky gut
- Leaky gut heals once SIBO's gone
  - 100% & 75% healed by 1 mo after SIBO eradicated
  - With no supplement or diet intervention
    - Like our skin, intestine heals once the cause is removed
  - Unless another cause is present, or another disease prevents tissue healing

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Food Reactions and SIBO

Can be due to:

1. Bacterial Fermentation
   - Digestive symptoms

     Ex: Bloating, constipation/diarrhea, abdominal pain, burping, flatulence, nausea, acid reflux

2. Leaky Small Intestine/Gut
   - Systemic symptoms

     Ex: Headache, nasal mucus, skin rash, joint pain, muscle pain, brain fog, poor memory, depression
   - Immune mediated

3. Non-SIBO generated: histamine, salicylate…

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Fiber Tips for SIBO

Avoid unless individually tolerated

- Prebiotics in supplements
  - FOS/GOS/MOS, inulin, arabinogalactan…
- Supplemental fiber
  - Flax, chia, psyllium, Benefiber, Metamucil, Citrucel
- Mucilaginous herbs for leaky gut healing
  - Aloe, slippery elm, marshmallow, licorice, comfrey
- Bone-Cartilage broth
  - Marrow-bone and meat broth = OK
- Check labels for binders/thickeners
  - Carrageenan, pectin, guar gum…
- Raw vegetables/salads

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Summary

1. SIBO is a colonization of SI with normal flora.
2. SIBO is common
3. Symptoms: bloating, pain, constipation/diarrhea
4. Causes: food poisoning (slow SI motility/MMC), obstruction
5. Fermentation (gas) and damage in SI create symptoms
6. SIBO can be treated and symptoms relieved
7. Relapse is common. Underlying cause must be addressed
8. SIBO can cause lactose/fructose malabsorption and leaky gut, which can reverse once SIBO's gone
9. By reducing fermentable CHO's, diet can significantly help sx

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