SIBO – Everything You Need To Know About The #1 Cause of IBS

Dr. Tomah Phillips, ND
Overview

- Intro – What is SIBO?
  - “Tolle causam” - Underlying causes

- Clinical manifestations

- Pathophysiology

- Diagnosis
  - Best options, and test interpretation

- Treatment
  - Pharmaceutical, herbal and dietary considerations

- Tips for preventing relapse
Bio

- Graduated from Boucher Institute of Naturopathic Medicine
- Instructor of Biomedical Sciences at Boucher
- Instructor of Physiology and Pathology at the Canadian School of Natural Nutrition
- Practice at Evoke Integrative Medicine in downtown Vancouver
- Medical advisor for Vita Aid Professional Therapeutics
What IS SIBO?

- Overgrowth of bacteria in the small intestine that normally should not reside there in significant quantities
- Bacteria interfere with normal digestion and nutrient absorption, and produce gases that lead to common IBS symptoms, such as gas, bloating, diarrhea/constipation
- A number of causes can lead to development of SIBO, and SIBO is associated with a variety of conditions
SIBO Defined

- No single accepted definition

- Previous gold standard = presence of $\geq 1 \times 10^5$ bacteria per mL of proximal SI aspiration
  - Others estimate normal subjects rarely exceed $1 \times 10^3$ cfu/mL

- In research and clinical practice, diagnosis often made indirectly through hydrogen/methane breath testing
Normal SI has low bacteria counts

- Above SI $\rightarrow$ HCl in stomach prevents overgrowth
- Below SI $\rightarrow$ Ileocecal valve separates colon from SI
- Migrating motor complex (MMC) periodically sweeps through the ‘cleanse’ SI of bacteria

SIBO characterized by high levels of *normal* colonic bacteria that ferment carbs $\rightarrow$ produce gas
- Bacteria are not pathogenic!
For a long time patients with abdominal pain, gas, bloating, and diarrhea/constipation were diagnosed with IBS.

ND’s have many tools for helping with IBS:
- Food allergy/sensitivity testing or elimination diet
- Enzymes, probiotics, omega-3s, etc
- Stress reduction

Many would get better – but what about those that don’t improve with the basics…?
SIBO – Why Should You Care?

- GI complaints are one of the most common reasons for doctors visits (both MD and ND)
  - IBS is the most common of all GI disorders

- Some studies estimate SIBO to be the underlying cause in **84% of IBS cases**
  - Other estimates as low as 30% of IBS cases – likely somewhere in between (50-75% of cases)

- Related to **MANY other common conditions**
  - Prevalence in celiac disease estimated at 50%

- Elderly may be more susceptible
  - Low HCl, polypharmacy
Bacterial overgrowth occurs when intestinal stasis gives bacteria the opportunity to proliferate locally, such as due to mechanical stasis following bowel surgery. Other prominent causes of stasis include diabetes, scleroderma, intestinal diverticulosis, and intestinal obstruction caused by strictures, adhesions, cancer. Certain medications may also predispose to SIBO, such as PPIs and opiates.
Other Underlying Causes

- Dysfunction of the Migrating Motor Complex (MMC)!
  - Due to gastroenteritis, diabetic neuropathy, hypothyroidism, sclerosis, nerve damage, opiates, surgery, stress
‘Post-Infectious IBS’

- SIBO often develops following bout of gastroenteritis
  - Estimated 7-31% of GI infxn will develop PI-IBS (SIBO)

- Bacteria (i.e. Campylobacteri jejuni) secrete cytolethal distending toxins (CDTs) that impair muscle & nerve connections and inactivate the MMC

- CDTb through molecular mimicry forms Abs to a cytoskeletal protein called vinculin → our immune system damages SI nerves and pacemaker cells while trying to attack the CDTb
Post-Infectious SIBO

Organisms that can trigger PI-IBS include *Campylobacter*, *Salmonella*, *Shigella*, *E. coli*, *Giardia*, and certain viruses.
SIBO Pathophysiology

Bacterial Growth

GI Sx's:
- Bloating
- Constipation/Diarrhea
- Pain

Fermentation of Unabsorbed Carbohydrate

† Disaccharidases (-) Carb Transporters
Blunted Villi, Crypt Depth
Intestinal Permeability

SI Bacterial Overgrowth

Bacterial Actions

† Inflammatory cytokines
Digest Brush Border
Bile Deconjugation → steatorrhea
fat sol vit deficiency A, D, E, K

Damage the Brush Border

Systemic Sx's

Dr Allison Siebecker
Non-specific/IBS Sx:
- Distension, flatulence, abd pain/discomfort, diarrhea, constipation

Malabsorption
- More in severe cases
- Def. of fat soluble vits, B12, iron

Systemic Sx:
- Can result from increased intestinal permeability (“leaky gut”)

Note: Symptoms can be distorted by underlying cause (i.e. scleroderma, diabetes, hypothyroid)
Hydrogen and methane gases are not normally produced by human cells

- Hydrogen $\rightarrow$ diarrhea
- Methane (produced by archaea) $\rightarrow$ constipation

Treatment will differ depending on presence and levels of gases
A Third Gas…?

- Hydrogen sulfide gas can also be produced by sulfate-reducing bacteria → convert H₂ to H₂S

- Not as well characterized as Hydrogen and Methane gas, as it is not detected on standard breath tests

- Clues for H₂S overgrowth:
  - “rotten egg” smelling flatulence
  - sensitivity to sulfur containing foods
  - SIBO sx but “flat-line” hydrogen and methane levels on breath test
Associated Conditions

- Acne Rosacea
- Acne Vulgaris
- Acromegaly
- Age
- Alcohol Consumption (moderate intake)
- Anemia
- Atrophic Gastritis
- Autism
- Celiac Disease
- Cystic Fibrosis
- Chronic Fatigue Syndrome
- Diabetes
- Diverticulitis
- Dyspepsia
- Fibromyalgia
- Fructose Malabsorption
- Gallstones
- Gastroparesis
- GERD
- HIV
- Hepatic Encephalopathy
- Hepatic Injury
- H. pylori Infection
- Hypochlorhydria
- Hypothyroid/Hashimoto's Thyroiditis
- IBD (Inflammatory Bowel Disease)
  - Crohn's
  - Ulcerative Colitis
- IBS (Irritable Bowel Syndrome)
- Interstitial Cystitis
- Lactose Intolerance
- Leaky Gut (Intestinal Permeability)
- Liver Cirrhosis
- Lyme
- Malabsorption Syndrome
- Medications: Proton Pump Inhibitors, Narcotics/Opioids, NSAIDS
- Muscular Dystrophy (myotonic Type I)
- Myelomeningocele (spina bifida)
- NASH/NAFLD (non-alcoholic steatohepatitis/non-alcoholic fatty liver)
- Obesity
- Pancreatitis
- Parasites
- Parkinson's
- Pernicious Anemia
- Prostatitis (chronic)
- Radiation Enteropathy
- Restless Leg Syndrome
- Rheumatoid Arthritis
- Scleroderma (Systemic Sclerosis)
- Short Bowel Syndrome
- Surgery: Abdominal, Post Gastrectomy, Post Esophageal and Gastric Cancer, Post-Cholecystectomy
- Tropical Sprue
- Whipple's Disease
SIBO ‘Clues’

- IBS develops following acute infectious gastroenteritis
- IBS sx improve with antibiotic use
- Worsening of IBS sx with prebiotics (FOS) or fiber intake
  - Constipation that is worse with fiber
- Celiac pt that does not improve on gluten-free diet
- IBS sx and chronic low ferritin with no other known cause
SIBO Diagnosis

- Stool testing is of little/no value
- Endoscopy/aspiration expensive and invasive, only samples proximal SI, contamination
- Best and most widely used test is hydrogen/methane breath test
  - Detects presence of hydrogen and/or methane gas produced in response to lactulose solution
Diagnosis – Breath Test

- Lactulose vs Glucose
  - Glucose rapidly absorbed in duodenum so may not detect distal SIBO
  - Avg transit through SI is ~120 minutes, so lactulose gives indication of distal SI

- Samples taken q20 minutes after baseline

- 3 Hour time should show second peak when lactulose reaches the LI and is fermented
Breath Test - Preparation

Prep Diet

- Meat/fish/poultry
- White rice
- Eggs
- Hard Cheese
- Clear beef or chicken broth
- Oil
- Salt and pepper

*12 hour fasting before test

What about vegetarian/vegan patients?
Breath Test

- https://sibocenter.com/faqs/

Instructions for taking the test.

Instructions for
- SIBOTest
- Fructose Malabsorption Test
- Lactose Malabsorption Test
Breath Test - Interpretation

Positive test considered:

- a rise over baseline in hydrogen production of 20 parts per million (PPM) or greater within 120 minutes after ingesting the test substrate

- a rise over baseline in methane production of 12 ppm or greater within 120 minutes after ingesting the test substrate

- a rise over baseline in the sum of hydrogen and methane production of 15 ppm or greater within 120 minutes after ingesting the test substrate
Breath Test Example

<table>
<thead>
<tr>
<th>Sample</th>
<th>Time</th>
<th>ppm H₂</th>
<th>ppm CH₄</th>
<th>Total H₂ + CH₄</th>
<th>CO₂ Check</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Baseline</td>
<td>10:30</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>OK</td>
</tr>
<tr>
<td>2. 20 min</td>
<td>10:52</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>OK</td>
</tr>
<tr>
<td>3. 40 min</td>
<td>11:12</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>OK</td>
</tr>
<tr>
<td>4. 60 min</td>
<td>11:32</td>
<td>8</td>
<td>2</td>
<td>10</td>
<td>OK</td>
</tr>
<tr>
<td>5. 80 min</td>
<td>11:52</td>
<td>9</td>
<td>1</td>
<td>10</td>
<td>OK</td>
</tr>
<tr>
<td>6. 100 min</td>
<td>12:12</td>
<td>16</td>
<td>3</td>
<td>19</td>
<td>OK</td>
</tr>
<tr>
<td>7. 120 min</td>
<td>12:32</td>
<td>23</td>
<td>5</td>
<td>28</td>
<td>OK</td>
</tr>
<tr>
<td>8. 140 min</td>
<td>12:52</td>
<td>24</td>
<td>4</td>
<td>28</td>
<td>OK</td>
</tr>
<tr>
<td>9. 160 min</td>
<td>13:12</td>
<td>33</td>
<td>4</td>
<td>37</td>
<td>OK</td>
</tr>
<tr>
<td>10. 180 min</td>
<td>13:32</td>
<td>40</td>
<td>6</td>
<td>46</td>
<td>OK</td>
</tr>
</tbody>
</table>

Notes:
- 11:47 mild stomach pain and diarrhea
- 12:24 mild stomach pain and normal stool
- 13:07 mild stomach pain and normal stool

<table>
<thead>
<tr>
<th>Result</th>
<th>Flag</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td></td>
<td>&lt;20PPM</td>
</tr>
<tr>
<td>22</td>
<td>H</td>
<td>&lt;20PPM</td>
</tr>
<tr>
<td>23</td>
<td>H</td>
<td>&lt;20PPM</td>
</tr>
<tr>
<td>4</td>
<td>H</td>
<td>&lt;12PPM</td>
</tr>
<tr>
<td>5</td>
<td>H</td>
<td>&lt;12PPM</td>
</tr>
<tr>
<td>24</td>
<td>H</td>
<td>&lt;15PPM</td>
</tr>
<tr>
<td>6</td>
<td>H</td>
<td>&lt;2PPM</td>
</tr>
</tbody>
</table>
Breath Test Example #2

Small Intestinal Bacterial Overgrowth (Lactulose) Analytical Record

Patient: Doe Jane
Patient ID: SAMPLE-1
DOB: 02/04/1985
Weight (at collection): 76 kg
Substrate given: Lactulose
Samples collected: 03/04/2016
Samples analyzed: 03/07/2016

Notes:
Pre-test notes:
Pre-test symptoms: Nausea, Vomiting, Weight Loss, Diarrhea, Bloating

In-test notes:

Diagnosis/recommendation:

Physician Signature:

Date:

<table>
<thead>
<tr>
<th>Time</th>
<th>ppm H2</th>
<th>ppm CH4</th>
<th>ppm H2 + CH4</th>
<th>% CO2</th>
<th>Correction</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>4</td>
<td>2</td>
<td>6</td>
<td>32</td>
<td>1.71</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>6</td>
<td>1</td>
<td>7</td>
<td>3.3</td>
<td>1.66</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>6</td>
<td>2</td>
<td>8</td>
<td>3.1</td>
<td>1.77</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>8</td>
<td>3</td>
<td>11</td>
<td>3.4</td>
<td>1.61</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>16</td>
<td>4</td>
<td>20</td>
<td>3.1</td>
<td>1.77</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>26</td>
<td>6</td>
<td>32</td>
<td>2.9</td>
<td>1.89</td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>20</td>
<td>3</td>
<td>23</td>
<td>4.1</td>
<td>1.34</td>
<td></td>
</tr>
<tr>
<td>140</td>
<td>32</td>
<td>6</td>
<td>38</td>
<td>3.5</td>
<td>1.57</td>
<td></td>
</tr>
<tr>
<td>160</td>
<td>40</td>
<td>7</td>
<td>47</td>
<td>3.9</td>
<td>1.41</td>
<td></td>
</tr>
<tr>
<td>180</td>
<td>48</td>
<td>8</td>
<td>56</td>
<td>4.3</td>
<td>1.27</td>
<td></td>
</tr>
</tbody>
</table>
Small Intestinal Bacterial Overgrowth (Lactulose) Analytical Record

Patient: John Doe
Patient ID: SAMPLE-2
DOB: 01/10/1970
Weight (at collection): 
Substrate given: Lactulose
Samples collected: 03/02/2016
Samples analyzed: 03/07/2016
Nurse/Technician:
Referring physician:

Notes:
Pre-test notes:
SAMPLE+COH2
Pre-test symptoms:
Nausea, Weight Gain, Constipation, Bloating
In-test notes:

Diagnosis recommendation:

Physician Signature:

Date:

<table>
<thead>
<tr>
<th>Sample</th>
<th>Time</th>
<th>ppm H2</th>
<th>ppm CH4</th>
<th>ppm H2 + CH4</th>
<th>%CO2</th>
<th>Correction</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>#0 - 0</td>
<td>7:20 AM</td>
<td>2</td>
<td>4</td>
<td>6</td>
<td>39</td>
<td>1.41</td>
<td></td>
</tr>
<tr>
<td>#1 - 20</td>
<td>7:40 AM</td>
<td>2</td>
<td>3</td>
<td>5</td>
<td>4.5</td>
<td>1.22</td>
<td></td>
</tr>
<tr>
<td>#2 - 40</td>
<td>8:00 AM</td>
<td>4</td>
<td>3</td>
<td>7</td>
<td>4.7</td>
<td>1.17</td>
<td></td>
</tr>
<tr>
<td>#3 - 60</td>
<td>8:20 AM</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>3.4</td>
<td>1.61</td>
<td></td>
</tr>
<tr>
<td>#4 - 80</td>
<td>8:40 AM</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>4.8</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>#5 - 100</td>
<td>9:00 AM</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>4.6</td>
<td>1.19</td>
<td></td>
</tr>
<tr>
<td>#6 - 120</td>
<td>9:20 AM</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>3.8</td>
<td>1.44</td>
<td></td>
</tr>
<tr>
<td>#7 - 140</td>
<td>9:40 AM</td>
<td>4</td>
<td>1</td>
<td>5</td>
<td>4.5</td>
<td>1.22</td>
<td></td>
</tr>
<tr>
<td>#8 - 160</td>
<td>10:00 AM</td>
<td>16</td>
<td>2</td>
<td>18</td>
<td>4.4</td>
<td>1.25</td>
<td></td>
</tr>
<tr>
<td>#9 - 180</td>
<td>10:20 AM</td>
<td>24</td>
<td>2</td>
<td>26</td>
<td>27</td>
<td>203</td>
<td></td>
</tr>
</tbody>
</table>
Treatment Steps

- Important to first identify if hydrogen and/or methane gases present

- May include liver support preparation stage (1-2 weeks) to reduce die-off reaction

- Then begin eradication phase (2-4 weeks) using pharmaceutical/herbal antimicrobials

- Then SIBO diet following eradication
  - Also include prokinetic agents
1. Eradication Phase – Rifaximin (Xifaxan)

- **Most commonly used antibiotic**
  - 550mg bid/tid x 14 days

- **Pros:**
  - Effective at eradicating SIBO
  - Not absorbed, so little/no s/e
  - Can be used on its own for hydrogen(+)

- **Cons:**
  - Needs to be combined with Neomycin (or other a/b, or allicin) for Methane(+) SIBO (constipation)
  - Expensive, may be difficult to find
1. Eradication Phase – Herbal

Many consider herbal antimicrobials as effective as Rifaximin.

However, needs to be used for longer time (4 weeks vs. 2 weeks).

And may see longer or more severe die-off reaction.

Options include:

- Berberine-containing herbs (Coptis chinesis, Berberis sp., Hydrastis)
- Allium sativum*
- Oregano
- Clove
- Neem
- Cinnamon

* May be best to rotate (i.e. herb combo for 2 weeks, then switch to different herbs for 2 weeks)
Pearl: Do **NOT** start SCD/SIBO diet during the eradication phase!

- Research shows that SIBO eradication is improved when a/b tx combined with fiber in diet

  “Happy bacteria as easier to kill”

- Wait until *after* eradication phase (2-4 weeks) to begin diet
There is no one-size fits all diet for SIBO

Most common are SCD, GAPS, low fodmap, or combination diet

May be able to introduce foods after a period of time (i.e. 2-3 months) and see how patient reacts

Elemental diet
  - Effective, but costly and poor taste
Specific Carbohydrate Diet

- Developed by Elaine Gottschall
  - “Breaking the Vicious Cycle” book and website are good resources
- Aim is to cut out specific carbs (disaccharides) to starve bacteria
- Avoids grains, starches, dairy
SIBO Diet

SIBO Food Guide

Legumes/Beans

- SCD “LEGAL” LOW FODMAP
  - Lentil: brown ½ c green & red ¼ c
  - Lima ¼ c

- SCD “LEGAL” MODERATE FODMAP
  - Black Lentil
  - Green & red ½ c
  - Lima 1/3 c

- SCD “LEGAL” HIGH FODMAP
  - Borlotti/Cranberry
  - Kidney/Red
  - Lima ½ c
  - Navy/White/Haricot Baked
  - Spilt pea

- SCD “ILLEGAL”
  - Butter
  - Cannellini
  - Chickpea/Garbanzo
  - Fava/Faba/Broad
  - Pinto
  - Soy

www.siboinfo.com/diet.html
Pearl: Key to preventing recurrence is stimulating migrating motor complex (MMC)
- Begin after eradication phase (use along with diet)

Pharma options include:
- Low dose erythromycin (50mg QD hs)
- Low dose naltrexone (2.5 mg q.h.s. for IBS-D or 2.5 mg b.i.d. for IBS-C)
- Prucalopride – *may be better for constipation than diarrhea*

Other options:
- 5-HTP
- D-limonene (consider if GERD also present)
- Probiotics: *Bifidobacterium lactis, Lactobacillus rhamnosus*
- Iberogast
- *Fasting in between meals/overnight stimulates MMC*
Preventing Relapse

Be sure to **treat the cause** (i.e. stimulate MMC, HCl, dec stress, etc)

- Betaine HCl
  - If hypochlorhydria suspected as part of underlying cause
  - Careful if methane(+) though

- Gut healing
  - L-Glutamine
  - Zinc carnosine

- Probiotics
  - Make sure without FOS
Thank You

This concludes the CE portion of the webinar
Protocol and Q&A

- Prep Phase
- Eradication Phase
- Maintenance Phase: Prokinetics & Recurrence Prevention
- Product Information
- Q&A
Protocol

- **Prep Phase** (1-2 weeks prior to Eradication Phase)
  - **Hepasylin**
    - Liver Support to minimize die-off reaction
    - Take 2 capsules QD AC
  - Glass of lemon water in the morning
  - Castor oil packs daily
Protocol

- **Eradication Phase** (4 weeks)
  - **Microcidin** – 1 capsule TID with food.
  - **Supreme-PB30+ DF (without FOS)** – Start with 1 capsule HS for 1 week.
    - If tolerated well, increase to 2 capsules HS from Weeks 2-4.
    - If NOT tolerated well, use **S. boulardii**, 2 capsules HS
  - **Hepasylin** (Liver Support to alleviate die-off reaction):
    - Weeks 1-2 of protocol – take 3 capsules QD AC
    - Weeks 3-4 of protocol – take 2 capsules QD AC
Protocol

- **Maintenance Phase:**
  - Prokinetic & Recurrence Prevention (3 months +)

- **Diet:**
  - If diet compliance is an issue, incorporate digestive enzymes.
  - *Zyme-Aid Carbo Fort* – 1 capsule CC, TID.
  - *5-HTP* – 1 cap (100 mg) 1 hour after each meal, and 1 cap hs
  - *D-Limonene* for patients with GERD – 12 drops on empty stomach BID or 24 drops HS.
  - *L-Glutamine Plus* – 1 teaspoon QD (3 g L-glutamine + Vitamins A/C/E)
  - *Supreme-PB30+ DF (without FOS)* – 1 capsule 2 hours after lunch, 1 capsule HS.
Questions are guaranteed in life; Answers aren't.
Microcidin

- Contains multiple antimicrobial ingredients with different mechanisms to inhibit and destroy the pathogenic microbials, such as bacteria, virus, fungi (eg. Candida albican) and parasites.

- Coptis (Huang Lian) contains high berberine. Coptis is the king herb for detoxification in Traditional Chinese Medicine, especially during infections and Damp Heat. In modern medicine, coptis itself or combined with clove extract have been proven to inhibit fungal growth and candidiasis.

- Contains lab-standardized high allicin content from freeze-dried garlic concentrate. Allicin is a potent natural antibiotic that does not cause dysbiosis.

- Synergized with highly concentrated oregano extract, undecylenic acid and caprylic acid for broad spectrum microcidal effect in prevention and eradication of microbial infections.
Supreme-PB30+ DF (without FOS)

- **Dairy-Free** probiotic formula that contains 55 billion viable cells comprised of 6 species of human gut-anchoring probiotics to ensure successful establishment in each of their particular niche.

- Includes *Bifidobacterium lactis* Bl-04 & *Lactobacillus rhamnosus* Lr-32

- Carefully selected strains with complete resistance tests (22 antibiotics)

- All strains are acid- and bile-resistant, ensuring their passage through the entire GI tract while helping inhibit H. pylori infections.

- Clinically proven to anchor and colonize at the human gut linings to improve dysbiosis-associated symptoms (e.g. constipation, diarrhea, bloating, and allergic reactions) caused by antibiotics and other GI disorders.
Limonen-E (d-limonene liquid)
- D-limonene has been shown to be effective in relieving occasional heartburn and gastroesophageal reflux disorder (GERD).
- Ultra-potent D-Limonene (>99.5%)
- 1 g of D-limonene (~24 drops) daily or every other day has been clinically shown to achieve complete relief of symptoms
Product Info

Hepasylin

- Formulated with milk thistle, dandelion, artichoke and alpha lipoic acid to protect the hepatocytes and maintain healthy liver function.
- Contains milk thistle extract standardized by not only silymarin (80%) but also silybin (30%) - the most active compound of silymarin group - to guarantee the maximum liver-protecting effect.
- Increases the reduced glutathione concentration in the liver, promotes bile flow, provides powerful antioxidants for cell protection, and enhances the liver's ability to detoxify.
Vita Aid will be offering **10% off** the following products until March 31st 2016:

- Microcidin
- 5-HTP
- Supreme-PB30+ DF (without FOS)
- Limonen-E
- Hepasylin
Thank You!

- Special thank you to Dr. Ibby Omole
References


- Steven Sandberg Lewis, ND, DHANP and Allison Siebecker, ND, MSOM. "SIBO: Dysbiosis Has A New Name. Townsend Letter March 2015.


