

Natural Approach to SIBO



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Small Intestinal Bacterial Overgrowth (SIBO) is defined as an increase in the number of bacteria, and/or changes in the types of bacteria present in the small bowel. In most patients, SIBO is not caused by a single type of bacteria, but is an overgrowth of the various types of bacteria that should normally be found in the colon. Less commonly, SIBO results from an increase in the otherwise normal bacteria of the small bowel.

The small intestinal bacteria are normally at low levels (less than 100,000/mL) but well-proportioned in terms of different species. They are kept in control by healthy (acidic) secretions from the stomach and the propulsive (downward) impulses of the electrical waves of peristalsis known as the migrating muscle complexes (MMC's) which sweep through the small intestine every 90-120 minutes during fasting, moving along indigestible substances and turning around any upwards travelling bacteria that actually belong in the large intestine.

SIBO can occur when bacteria accumulates in the small intestine, generally from the following causes:

- 🌱 Decreased migrating motor complex (MMC), which moves bacteria down into the large intestine during fasting at night and between meals, clearing them from the small intestine on a daily basis
- 🌱 Obstruction in the small intestine
- 🌱 Non-draining pockets in the small intestine (diverticuli)
- 🌱 Dysfunction of intestinal nerves or muscles

Either bacterial overgrowth or the overgrowth of methanogenic archaea leads to impairment of digestion and absorption and produces excess quantities of hydrogen, hydrogen sulfide or methane gas. Hydrogen and methane are not produced by human cells but are the metabolic products of fermentation of carbohydrates by intestinal organisms. These gases lead to the localized stomach symptoms people experience with SIBO but also cause the systemic symptoms by creating toxicity for the liver, as well as hyperacidity in the body. High levels of acidity results in localized and systemic low grade or frank metabolic acidosis. This acidity is hypothesized to be the cause of many symptoms people experience.

Because these bacteria are supposed to be in the large intestine, they are mostly species that ferment carbohydrates into hydrogen gas (H₂) or archaea (not technically bacteria) that produce methane gas (CH₄). While both types will usually result in abdominal bloating and distention, SIBO sufferers are usually divided into one of three different categories;

1. SIBO-D: Diarrhea and Hydrogen-Producing Bacteria

This is the more common form of diagnosed SIBO and is the result of carbohydrate-fermenting bacteria that produce hydrogen gas in the small intestine. And unlike the large intestine, the small intestine is super sensitive to the production of hydrogen, which is what causes the abdominal bloating and the diarrhea.

2. SIBO-C: Constipation and Methane-Producing Archaea

It's not technically bacteria, but single-celled organisms called archaea, that are mostly responsible for the constipation-dominant form of SIBO. Only half of the world's population are thought to have detectable levels of archaea in their gastrointestinal tract, and only from about three years of age. Archaea, such as *Methanobrevibacter smithii*, feed off the hydrogen produced by bacteria during the fermentation of carbohydrates and produce a by-product of their own – methane. As with hydrogen in the small intestine, methane gas will also cause abdominal bloating, plus a much bigger problem – it slows down transit time which leads to constipation. Constipation allows more bacteria to grow, which causes more methane and more constipation... and so on. And archaea are more stubborn and difficult to treat with antibiotics and antimicrobials. They can also survive for a while without hydrogen, so killing their food source can also have minimal short-term benefits. Basically, methanogens are tough critters to kill.

3. Hydrogen Sulphide-Producing Bacteria and 'Rotten Egg' Gas

While less common, a third type of SIBO is gaining attention because of its prevalence amongst those with SIBO symptoms, who test negative on traditional breath testing. Sulphate-reducing bacteria (SRB) in the small intestine produce hydrogen sulphide, a highly toxic gas to the cells of the intestinal wall, best known for its distinctively foul odour of rotten eggs. Because they also consume hydrogen, these bacteria compete with methanogenic archaea (SIBO-C type) and may keep levels of each other in-check (8). But for those with both types, this means that killing only one species may allow the other to overgrow further. Hydrogen/methane breath testing is the most widely used diagnostic method for this condition. Stool analysis has no value in diagnosing SIBO.

When commensals (oral, small intestine or large intestine flora) multiply in the small intestine to excessive numbers, IBS is likely. These symptoms including bloating, abdominal pain, diarrhea, constipation and flatulence in addition to being often associated with leaky gut, autoimmune conditions, food intolerances and even nutrient deficiencies.

SIBO is a chronic infection and an inflammatory condition in the gut. Because it can be so difficult to treat, it requires a combination of specific diet and a broad range of natural treatment with specific supplements to help boost intestinal movement (prokinetics), support digestion, reverse nutrient deficiencies, reduce inflammation, rebuild the intestinal lining, repopulate with the appropriate bacteria and more.

Signature Supplements Inc. offers many supplements that can assist in the management of SIBO. The products are available in both powder and capsule (vegetarian or gelatin) form. All supplements are free from binders, fillers and common allergens. They are available individually or in combination with other supplements, as determined by the practitioner. We encourage you to create the perfect formulas for your patients, either by creating individual custom formulas per patient to address unique symptoms or to create your own combination stock products that can assist a larger population of patients.

What Causes the Bacterial Overgrowth?

The gut relies on nerves, muscles, enzymes and neurotransmitters to properly digest food. While enzymes mainly break down our food, the nerves, muscles and neurotransmitters physically move the food through our digestive tract from the stomach to the small intestine and to the colon. When this happens in a healthy gut, bacteria gets passed through the digestive tract along with the food to its final destination in the colon. Problems arise when something interferes with this process.

The body has a number of positive mechanisms to prevent SIBO from occurring:

- 🌱 **Stomach Acid Secretion** – maintains an acidic environment for killing off bad bacteria before they enter the small intestine.
- 🌱 **Bile Secretion** – produced in the liver, stored in the gallbladder and released into the small intestine, bile protects against bad bacteria within the small intestine.
- 🌱 **Migrating Motor Complex (MMC)** – waves of small intestinal wall muscular activity that happens about every 90-120 minutes and typically between meals moves waste and unwanted bacteria through the digestive tract and to the colon. The MMC is not the same as peristalsis that happens in the large intestines.
- 🌱 **Immune System** – the fluid in the small intestine contains immunoglobulins that act as antibodies to fight bacteria and other pathogens.
- 🌱 **Ileocecal Valve** – this is a one-way valve that allows the flow of contents into the large intestine but prevents them from refluxing back into the small intestine.

Basically, to get SIBO, one or more of these protective mechanisms needs to fail. There are many causes of SIBO, most of which are complex and affect more than one of the protective mechanisms discussed above. However, they can be grouped into three main categories: MMC Damage, Structural and Functional.

Damage to the Migrating Motor Complex (MMC)

This is where bacteria are not cleared or swept away from the small intestine correctly. Conditions that increase the risk of impaired MMC function include:

- 🌱 Gastroenteritis
- 🌱 Lyme Disease
- 🌱 IBD
- 🌱 C. Difficile
- 🌱 Scleroderma
- 🌱 Medications, including antibiotics, proton pump inhibitors and pain relievers
- 🌱 Diabetes
- 🌱 Hypothyroidism

Post-Infectious SIBO

The result of an impaired migrating motor complex caused by an episode of acute gastroenteritis. The following are the four most common infections organisms responsible for food poisoning:

- 🌱 Campylobacter jejuni
- 🌱 Salmonella
- 🌱 Escherichia coli
- 🌱 Shigella

Basically, once a patient has a bout of infectious gastroenteritis, the risk of getting IBS/SIBO increases by as much as six fold.

Altered Anatomy/Structural Abnormalities

Anatomical changes can result in bacterial clearance being blocked within the small intestine or allow migration of bacteria from the large intestine back up into the small intestine. These include conditions such as:

- 🌱 Adhesions
- 🌱 Obstructions
- 🌱 Cancer
- 🌱 IBD stricture
- 🌱 Ileocecal valve removal or impairment
- 🌱 Superior mesenteric artery syndrome
- 🌱 Non-draining pocket

Altered Physiology (Functional)

In this situation, the function of the body has been altered and bacteria are not killed off in the stomach or small intestine as they should be, often as a result of:

- 🌱 Hypochlorhydria
- 🌱 Altered bile flow and enzyme production
- 🌱 Medications such as proton pump inhibitors (PPIs) and antacids
- 🌱 Immunodeficiency
- 🌱 Leaky gut (damage to the small intestinal walls)

The most common cause is from a diet high in sugar, refined carbohydrates and alcohol.

Signs and Symptoms of SIBO

Symptoms of SIBO closely mirror those of IBS and for good reason. It is estimated that up to 85% of IBS cases are actually caused by SIBO. Most SIBO sufferers are categorized as constipation or diarrhea-dominant. But of all the symptoms, the most frequent and distinguishable in clinical practice seems to be that of excessive bloating within 5-60 minutes after eating.

The most common symptoms of SIBO are:

- 🌱 Gas and bloating within one hour after meals
- 🌱 Chronic diarrhea or chronic constipation or alternating constipation and diarrhea
- 🌱 Burping or reflux after meals
- 🌱 Foul smelling gas
- 🌱 Stomach gurgling and discomfort or cramping

Secondary symptoms that often accompany the most common symptoms of SIBO are:

- 🌱 Restless legs at night
- 🌱 Joint pain
- 🌱 Mood changes
- 🌱 Multiple food sensitivities/intolerances like gluten, casein, lactose, fructose and more
- 🌱 Respiratory symptoms such as asthma
- 🌱 Skin issue eg. acne, psoriasis, eczema
- 🌱 Memory issues and foggy thinking
- 🌱 Weight gain or loss
- 🌱 Difficulty sleeping
- 🌱 Malabsorption and malnutrition eg. chronic iron and/or B12 deficiency
- 🌱 Sugar and carbohydrate cravings
- 🌱 Chronic illnesses eg. headache, fibromyalgia, CFS, diabetes, neuromuscular disorders and autoimmune diseases

Overgrowth of Bacteria Causes a Number of Systemic Conditions

SIBO not only affects the digestive system, but it also has far-reaching consequences. Bacterial overgrowth damages the lining of the small intestine, resulting in poor digestion, poor nutrient absorption and inflammation. SIBO has been associated with conditions such as (but not limited to):

- 🌱 Decreased T4 to T3 conversion/hypothyroidism
- 🌱 Increased inflammation in the GI tract, damage to intestinal wall including leaky gut
- 🌱 Constipation due to production of methane gas

- 🌱 Malabsorption of nutrients, malnutrition, anemia
- 🌱 Irritable bowel syndrome like symptoms
- 🌱 Decreased digestion of food
- 🌱 Acid reflux or changes in stomach acid
- 🌱 Osteoporosis
- 🌱 Histamine intolerance due to the overgrowth of bacteria producing excess histamine from undigested food

Treatment Goals

SIBO is infamously difficult to kill and even more difficult to keep that way. This is because attacking a small intestinal bacterial overgrowth with anything less than really comprehensive protocol that is more than just diet or antibiotics, is essential for long-term healing. The treatment goals for addressing this multifactorial condition can be summarized as follows:

1. **REMOVE unhealthy bacteria and correct dysbiosis**
 - 🌱 SIBO-Supportive diet and nutritional considerations
 - 🌱 Weeding and reducing the bacterial burden
2. **REPLACE missing components of optimal digestion and nutrients**
 - 🌱 Support digestion with enzymes, HCl or bile salts
 - 🌱 Balance nutritional deficits
3. **REPAIR damaged tissue**
 - 🌱 Repair and rebuild the intestinal lining and reduce inflammation
 - 🌱 Liver support
 - 🌱 Herbal cholinergics
 - 🌱 MMC complex with prokinetics
 - 🌱 Biofilm busters
4. **REPOPULATE to restore proper balance of bacteria**
 - 🌱 Bacterial supplements
5. **REBALANCE by working on other areas of the body, dealing with mind-gut connection**

REMOVE

SIBO-Supportive Diet and Nutritional Considerations

The best way to increase the odds of beating SIBO for good is by following a SIBO-supportive diet. Luckily, there are a few different options for SIBO diets to choose from. And while they're all unique, the one thing they have in common is reducing carbohydrates and sugar, which is the quickest way to stop feeding the bad bacteria and get the body back on track.

Make sure to follow the Low FODMAP Diet only when the herbal or prescription antibiotics are almost done.

- 🌱 Specific Carbohydrate Diet (The SCD Diet)
- 🌱 Gut And Psychology Syndrome Diet (GAPS Diet)
- 🌱 Bone Broth
- 🌱 Coconut Oil
- 🌱 Low FODMAP Diet
- 🌱 SIBO Specific Food Guide
- 🌱 Histamines and Oxalates
- 🌱 Elemental Diet (powdered, predigested nutrients mixed with water and removing all solid foods for 2-3 weeks)
- 🌱 Collagens
- 🌱 Proteins
- 🌱 Protein formulas

Weeding and Reducing the Bacterial Burden

Herbal antibiotics therapy reduces and/or eliminates the bacterial overload. Ideally, antibiotic therapy would be based on bacterial culture and sensitivity data.

Many of the herbs that have antibacterial properties are also powerful antifungals (such as cinnamon, berberine, cat's claw, oregano, pau d'arco and grapefruit seed extract). Since Candida frequently accompanies bacterial overgrowth, this is very helpful to address both bacteria and yeast.

SIBO patients often require multiple rounds or continuous courses of antibiotic therapy. To prevent resistance, it is recommended to rotate antibiotic regimens.

One expert recommends berberine, neem and oregano for hydrogen-dominant SIBO and garlic, neem and oregano for methane-dominant SIBO.

Signature Supplements has formulated three new antibacterial formulas to satisfy every patient's needs.

Raw Materials		Combination Stock Products
- Artemisinin - Barberry - Berberine - Black Walnut - Caprylic Acid - Cat's Claw - Cinnamon - Clove - Garlic - Goldenseal - Grapefruit Seed Extract	- Lemon Balm - Neem - Olive Leaf - Oregano - Oregon Grape - Pau d'Arco - Pomegranate - Sage - Undecanoic Acid - Wormwood	- SIBO Cidin Formula 1, 2 and 3 - Candida Terminator 1 and 2 - Gut Bug Terminator 1 and 2 - Immune Support 2

REPLACE

Support Digestion

It is vital to support digestion and enhance absorption of nutrients from both dietary and supplemental intake. This is because an overgrowth in the small intestine blocks the intestinal lining where absorption of nutrients occur. Assistance with digestion can involve the stomach, small intestine, pancreas, liver and gallbladder.

Gastric, pancreatic and gallbladder secretions, hydrochloric acid, enzymes and bile are bactericidal/static.

Raw Materials		Combination Stock Products
- Betaine HCl - Bitters such as gentian - Bromelain - Ox Bile - Pancreatic Enzymes	- Pancreatin - Papain - Pepsin - Triphala	- Basic Enzymes - Complete Enzyme Formula - Special Enzyme Formula

Balance Nutritional Deficits

SIBO can lead to nutritional deficiencies on top of those due to poor digestion or absorption. Essential nutrients, protein, carbohydrates and fats aren't properly absorbed, causing deficiencies. These deficiencies can lead to symptoms, including weakness, fatigue, confusion and damage to the central nervous system. Nutritional support, particularly in those patients with weight loss or vitamin and mineral deficiencies, is an important component of SIBO treatment. As well, malabsorption induced by rapid intestinal transit time can lead to the loss of both macronutrients and micronutrients.

Raw Materials	Combination Stock Products	
- All vitamins - All minerals - Other nutrients	- B Complex - Complete B - Stress B - Super B	- Advanced Multi - Complete Multi - Complete Multi Plus

REPAIR

Repair and Rebuild the Intestinal Lining and Reduce Inflammation

Since SIBO always causes leaky gut, it is important to rebuild the integrity of the intestinal membranes. Brush border healing supplements may be given to assist the repair of small intestine tissue. While mucilaginous herbs are traditionally employed for this purpose (licorice, slippery elm, aloe vera and marshmallow), their use is controversial post SIBO, due to their high level of mucopolysaccharides, which are fermentable and could encourage bacterial regrowth.

Once the SIBO infection is removed and missing digestive constituents are replaced, the final step is to repair the damage to the gut lining caused by the infection. Several nutrients are absolutely necessary for the gut to begin healing itself. One of these is l-glutamine, an amino acid that serves as the fuel for enterocytes (cells lining the gut wall). There are several other soothing herbs, vitamins and minerals that serve to rejuvenate the gut lining and restore the integrity of the intestinal barrier.

The following list of herbs and other natural products provide either leaky gut repair and/or anti-inflammatory activity. Our SIBO Intestinal Formulas are similar to our regular Intestinal Formulas but revised to eliminate the prebiotic components that are not recommended for SIBO patients.

Raw Materials		Combination Stock Products
- Boswellia - Bromelain 2400 GDU - Collagen - DGL - Ginger Root & Ginger 5% - Glutamine - Glutathione - Glycine - Grapeseed Extract 95% - Green Tea 50% - Licorice 26%	- Marshmallow Root - N-Acetyl-Glucosamine - Quercetin - Resveratrol - Rosemary - S-Acetyl Glutathione - Slippery Elm - Turmeric (Meriva®, Turmeric BCM-95®, C3 Complex®) - Zinc Carnosine	- SIBO Intestinal Formula 1, 2, 3, 4, 5 - Anti-Inflammatory Formula 1 and 2 - Anti-Inflammatory Support - Gastric Healing Formula - GI Formula 1 and 2 - IBS Advanced Formula - IBS Formula - Stomach Formula 1 and 2

Liver Support

During die-off of the bacterial overgrowth, there is a buildup of toxins in the body that need to be removed. This places excess stress on the liver. There are many herbs and nutraceuticals that contribute to a healthy detoxification response.

Raw Materials		Combination Stock Products
- Activated Charcoal - Bentonite - Broccoli SGS - Choline - Dandelion - Ginger	- Glycine - Inositol - Methionine - Milk Thistle - SAMe - Turmeric (Meriva®, BCM-95®)	- Detox Formula - Gallbladder Formula - Liver Formula 1, 2, 3

Natural Cholinergics

Cholinergic neurons in the GI tract coordinate intestinal motility. The cholinergic neurons cause contraction and shortening of the circular muscular layer, shortening of the longitudinal muscle and distention of the intestine.

Natural cholinergic support includes:

- Phosphatidyl choline
- Pantothenic acid
- Huperzine A
- Acetyl-L-Carnitine – supports autonomic neuronal health and contributes acetyl groups for the synthesis of acetylcholine, supporting neurotransmission of signals to encourage healthy motility

Prokinetics

Prokinetics (agents that enhance gastrointestinal motility) are used to stimulate the cleaning wave or migrating motor complex (MMC), the “housekeeper” of the small intestine, sweeping away debris and bacteria. This mechanism is often not working in people with SIBO; in fact, its malfunctioning is a primary underlying cause. This is especially important because methane gas (which is produced from bacterial overgrowth) slows down and almost paralyzes the GI tract. Prokinetics are also very important to promote bowel movements because every bowel movement causes elimination of excess bacterial load in the form of stool.

A key underlying cause of SIBO is thought to be deficient activity of the migrating motor complex (MMC). An intact MMC moves debris and bacteria down into the large intestine during fasting at night and between meals. Prokinetics stimulate the MMC, symptomatically correcting this underlying cause.

It is thought that methane has an effect on serotonin production in the gut. Serotonin affects intestinal motility. In those with methane-dominant SIBO, serotonin production may not be adequate to get the MMC working properly. Constipation SIBO cases are notoriously much harder to treat and relapse is very common. The missing piece in these cases is probably a prokinetic, which ideally needs to be a part of the treatment and prevention regimen.

Our Motility Formulas combine many of the nutraceuticals, herbs and other raw materials into formulas that can improve the motility and MMC component of SIBO.

Melatonin (3-5 mg taken at bedtime) also enhances motility.

Raw Materials		Combination Stock Products
5-HTP - Acetyl-L-Carnitine - Ginger 5% - Ginger Root - Triphala	- Nattokinase - Serrazimes® - Sodium Bicarbonate - Melatonin	- Motility Formula 1 - Motility Formula 2 - Motility Formula 3

Biofilm Busters

An estimated 75% of bacterial infections, and possibly higher in archaeal and fungal infections, involve biofilms. Biofilms are colonies of microorganisms that are protected by an extracellular matrix – which can be thought of as a protective home for the infection to live in. This protective home makes the infection up to 1000 times more resistant to antibiotic therapies and therefore, more difficult to kill. This is why a comprehensive antimicrobial SIBO treatment protocol should include the use of a biofilm disrupting agent.

Enzymes serve a dual purpose as they will decompose the biofilm and attack the cell structure of fungi.

Raw Materials		Combination Stock Products
- Boswellia - Cellulase - Lactoferrin - NAC	- Nattokinase - Serrazimes® - Sodium Bicarbonate	- Anti-Inflammatory Enzymes - Anti-Inflammatory Enzymes Plus - Proteozymes Formula - Serra-Natto Formula

REPOPULATE

Probiotics

Restoring a proper balance of good bacteria is a critical part of re-establishing a healthy microbiome after the SIBO is eradicated. Some practitioners do not recommend using prebiotics or probiotics on SIBO until it is known if the migrating motor complex works.

For several years now, there has been much said about the benefits of probiotics in restoring gut health. This has mainly been attributed to topping up certain bacteria in an effort to overwhelm bacteria which have become pathogenic. However, recent research suggests that certain bacteria are influential in restoring effective motility of cleaning waves and that this could be a reason

why certain probiotic strains are of benefit to those people suffering from SIBO. The microflora specifically identified, but only in studies on rats, are:

- 🌱 *Bifidobacterium lactis*
- 🌱 *Bifidobacterium bifidum*
- 🌱 *Lactobacillus rhamnosus*
- 🌱 *Lactobacillus acidophilus*

Other studies looking at the prokinetic effects of probiotics have actually been tested on humans and, depending on the symptom, have been shown to reduce the effects of constipation. These include:

- 🌱 *Lactobacillus reuteri*
- 🌱 *Lactobacillus casei*
- 🌱 *Bifidobacterium breve*

A key point for the use of probiotic supplements in SIBO is to avoid prebiotics as main ingredients. Prebiotics are fermentable food for bacteria that can exacerbate symptoms during active SIBO and encourage bacterial growth post SIBO. Common prebiotics found in probiotic supplements include FOS (fructooligosaccharide), inulin, arabinogalactan, MOS (mannose-oligosaccharide) and GOS (galactooligosaccharide). Prebiotics may be tolerated in small amounts used as base ingredients, but this depends on the individual.

Probiotics should be D-Lactate free. D-lactate is a result of fermentation of probiotic bacteria in the digestive system. An excess of D-lactate in the body can produce digestive and neurological problems especially with people with Short Bowel Syndrome and autism.

Our single strain probiotics are all made with rice maltodextrin and not FOS. Here is a list of the species we offer as single species that can be combined in a stock product for multiple patients or administered by themselves if desired. We have also created five new probiotic formulas specifically indicated for SIBO.

Raw Materials		Combination Stock Products
🌱 <i>Bacillus coagulans</i>	🌱 <i>Lactobacillus helveticus</i>	🌱 SIBO Pro 1
🌱 <i>Bifidobacteria bifidum</i>	🌱 <i>Lactobacillus plantarum</i>	🌱 SIBO Pro 2
🌱 <i>Bifidobacteria breve</i>	🌱 <i>Lactobacillus reuteri</i>	🌱 SIBO Pro 3
🌱 <i>Bifidobacteria infantis</i>	🌱 <i>Lactobacillus rhamnosus</i>	🌱 SIBO Pro 4
🌱 <i>Bifidobacteria lactis</i>	🌱 Multi Strain Bacteria Blend	🌱 SIBO Pro 5
🌱 <i>Bifidobacteria longum</i>	🌱 <i>Saccharomyces boulardii</i>	
🌱 <i>Lactobacillus acidophilus</i>	🌱 <i>Streptococcus thermophilus</i>	
🌱 <i>Lactobacillus bulgaricus</i>		
🌱 <i>Lactobacillus casei</i>		
🌱 <i>Lactobacillus gasseri</i>		

REBALANCE

Make Sure to Address These Possible Issues

Mind-Gut Connection

- 🌱 Many clinicians have observed that emotional conflicts appear to provoke exacerbation of colitis and IBS.
- 🌱 A brain-mast cell connection is the most likely mechanism of symptom exacerbation by psychogenic stress in patients with IBS.
- 🌱 Gut sensitivity seems to be increased by stress and decreased by relaxation.
- 🌱 The gut affects the HPA axis directly. EG Stress induced in early life leads to dysbiosis in germ-free mice – which causes abnormal behaviour, and anxiety and aggression can be transferred by fecal transplant. The integrated microbiota-gut-brain-axis, which links the microbiota with the central nervous system (CNS), the autonomic and enteric nervous system and the hypothalamic-pituitary-adrenal (HPA) axis via immune, neural and endocrine pathways, may allow bacteria to affect cognitive function and behaviour. Stress affects this by reducing the MMC, which affects the movements, secretions and permeability of the gut. Bacteria can release stress hormones, and germ-free mice show (reversible) exaggerated HPA responses to mild restraint stress, through increased levels of adrenocorticotrophic hormone (ACTH) and corticosterone. Sleep is also controlled by bacteria who release 'Factor S'.

Adrenal Exhaustion

- Adrenal exhaustion is very common in today's society and can be a factor in anyone with a condition such as SIBO.
- Herbal adrenal adaptogens can be very effective at restoring proper adrenal function.

Blood Sugar Dysregulation

- If SIBO was partly caused by a diet high in simple carbohydrates, it is likely that blood sugar dysregulation is an issue as well.
- Much of the blood sugar imbalances will be dealt with through dietary changes and modifications, however, supplements such as chromium, gymnema, cinnamon and others may be useful in the rebalancing of the pancreas as well.

Other Supplements to Consider

Melatonin

- Melatonin has been studied as a co-adjuvant treatment in several gastrointestinal diseases including IBS, constipation-predominant IBS (IBS - C), diarrhea-predominant IBS (IBS - D), Crohn's disease, ulcerative colitis and necrotizing enterocolitis.
- Melatonin plays an important part in gastrointestinal physiology which includes regulation of gastrointestinal motility, local anti-inflammatory reaction as well as moderation of visceral sensation.
- Melatonin, an important mediator of the brain gut axis, has been shown to exhibit important protective effects against stress-induced lesions in the gastrointestinal tract.
- Melatonin has a positive impact on IBD with no or negligible side effects. Such results have been mostly explained through free radical scavenging and diminishing inflammation.

SunFiber® Partially Hydrolyzed Guar Gum

- There is evidence that SunFiber® Partially Hydrolyzed Guar Gum (PHGG) has positive effects on patients with IBS.
- Four weeks of PHGG use has been shown to accelerate colon transit time in patients with chronic constipation, especially in those with slow transit, and improves many of their symptoms including frequency of bowel movements.
- A clinical trial in Italy has shown that the combination of rifaximin with partially hydrolyzed guar gum is more effective than rifaximin alone in eradicating small intestinal bacterial overgrowth.
- SunFiber® has been clinically shown to help eradicate SIBO.
- SunFiber® is the only prebiotic fibre that has Low FODMAP Certification from Monash University.
- We offer SunFiber® by itself as a standalone product and use it in our SIBO Intestinal formulas as well as SIBO safe flavours.

Activated Charcoal

- Activated charcoal can bind to endotoxins produced in the gut when ingested.
- Binding of endotoxins in our digestive tract reduces inflammation, improves liver/kidney function and helps reduce symptoms of a Herxheimer reaction.
- Activated charcoal can also absorb excess gas produced by overgrowth that might reduce bloating and abdominal pain.
- The action of activated charcoal involves adsorption, not absorption, of toxins from the intestinal tract. Adsorption is the electrical attraction of toxins to the surfaces of the fine charcoal particles.
- The charcoal itself is not absorbed into the body, so the toxins attached to the charcoal particles exit via the bowels.

Flavours

- We have created several flavours that are specially designed for those with SIBO.
- They are the same as our regular flavours, but without larch arabinogalactan, a prebiotic, which is used in our regular flavours as a filler to be able to easily measure a serving size.
- These flavours can be added to custom formulas for individual patients, or added to Practitioner-Designed Stock Products that you create for multiple patients, or purchased separately as stand-alone products to sell to patients.
- Patients can use these flavours in water, smoothies, to make popsicles with, to add to plain unflavoured yogurt if allowed.
- They contain natural flavours, malic acid, a non-bitter stevia and SunFiber® as the filler instead of larch.
- They can be a godsend for patients that are off sugar of all kinds.
- Here is the list of available SIBO friendly flavours:
 - Mixed Berry Flavour with SunFiber®
 - Chocolate Flavour with SunFiber®
 - Vanilla Flavour with SunFiber®