

# **SIBO - Small Intestine Bacterial Overgrowth - Clinical Implications and Effective Natural Therapeutic Options**

**By Kurt N. Woeller, D.O. and Angela Chilcott**

Dysbiosis has been a term tossed around in the field of functional and integrative medicine for many years as a way to describe an imbalance of intestinal bacteria leading to a myriad of common and chronic digestive symptoms such as constipation and/or diarrhea, abdominal cramping, and excessive gas and bloating. Another name for dysbiosis is dys-symbiosis which is defined as “an imbalance in the intestinal bacteria that precipitates changes in normal activities of the gastrointestinal tract ...resulting in health problems.”(1) Dysbiosis may often lead to intestinal permeability or “leaky gut” which begins a cascade of inflammatory processes and is a cause of autoimmune disease and other chronic illnesses.

The causes of dysbiosis are varied, but for many individuals, the most common cause or contributing factor comes from antibiotic use, which increases the growth of opportunistic bacteria and yeast via the reduction of normal flora. Diet plays a significant role also, and a diet full of processed foods including refined sugar and trans-fats and lacking in fiber further promotes the underlying imbalance. Food allergies and sensitivities as seen in gluten and dairy intolerance can trigger inflammation and imbalance in the digestive system as well. Additional factors leading to dysbiosis can include infectious bacteria such as *Clostridia difficile*, parasitic infections, environmental toxins, chemical exposures, and reduced hydrochloric acid and other digestive enzymes. The accumulation of some or all of these events can lead to chronic dysbiosis and the eventual development of Small Intestine Bacterial Overgrowth (SIBO).

Dysbiosis is now being applied to another common, and until recently misunderstood, intestinal bacterial problem called Small Intestine Bacterial Overgrowth (SIBO). SIBO has even caught on in traditional medical circles as a way to describe a myriad of digestive complaints contributing to ‘irritable bowel syndrome,’ which is now understood to be a specific entity of intestinal bacteria imbalance isolated to the small bowel.

## **Small Intestine Bacterial Overgrowth (SIBO)**

SIBO is a condition where large numbers of normal bacteria are found in the small intestines. The small intestine is made up the duodenum (first section), jejunum (middle section) and ileum (last section before entering the large intestine) and each has a unique function in digestion, nutrient absorption, and immune function. The small intestine is separated from the stomach by the pyloric sphincter and the large intestine by the ileocecal valve. Therefore, the digestive system is really separate compartments, each with its own unique biochemistry, immune regulation, and function in the process of food assimilation and toxin elimination.

The small intestine plays a critical role in digestive function as it has a direct connection to the liver and pancreas through the biliary tree for bile acids and digestive enzymes necessary for nutrient absorption and waste elimination. The small intestine also contains the main area of digestive, immune cell concentration located in the jejunum region before entry into the large bowel. The large intestine is important as well for the concentration of waste material in fecal matter and the reabsorption of water and electrolytes back into general circulation to maintain normal body hydration. Because of the compartmentalization of the digestive system, particularly the small intestine and large intestine, it is known that they both contain unique normal bacteria.

### **Symptoms of SIBO**

The symptoms of SIBO can be much broader than irritable bowel syndrome or common dysbiosis and include, but are not limited to the following:

- Heartburn/reflux.
- Abdominal pain including cramping.
- Mixed bowel elimination patterns, i.e. alternating constipation and diarrhea.
- Excessive flatulence.
- Nausea.
- Malabsorption problems, i.e. fat-soluble vitamins, vitamin B12, iron.
- Systemic complaints such as fatigue, body/joint pain, headaches, and skin disorders.

As mentioned previously many individuals found to have SIBO often complain of a myriad of these problems listed above and either go undiagnosed or perhaps carry a diagnosis of irritable bowel syndrome for many years. In fact, SIBO can be a cause of IBS and research has determined that approximately 80% or more of those with IBS have SIBO (2).

### **Diagnosis**

Small Intestine Bacterial Overgrowth is most commonly assessed using a methane breath test. This test involves collecting a baseline sample (after a 1 to 2-day preparatory diet) and then ingesting a lactulose or glucose solution. Lactulose is a synthetic sugar which acts as a substrate for bacterial fermentation. The digestive bacteria in the small intestine act upon these sugars and through their metabolic processes produce methane and hydrogen gas which is detected by a breath analyzer over a period of time with successive sample collections. These measurements are then analyzed by the lab against a baseline test to determine the likelihood of SIBO. Quintron Labs provides breath test kits and analysis at [www.breathtests.com](http://www.breathtests.com). BioHealth Laboratory also provides access to various SIBO breath tests too – [www.biohealthlab.com](http://www.biohealthlab.com).

A marker called *4-hydroxyphenylacetic acid* has been in the past as an indicator of small bowel disease as well. In fact, a research study dating back to the 70's in the Journal of Clinical Chemistry showed that this compound could be a useful marker for small bowel disease (3). SIBO is an example of a small bowel disorder. 4-hydroxyphenylacetic acid is one of the compounds available from the Organic Acids Test from Great Plains Laboratory – [www.greatplainslaboratory.com](http://www.greatplainslaboratory.com).

## **Pathophysiology**

The pathophysiology of SIBO is complex and multifaceted. For this discussion, let's focus on the main avenues in which SIBO can manifest – *namely from post-infectious irritable bowel syndrome (IBS)*:

- Various organisms can trigger dysfunction in the digestive system particularly in the region between the large and small intestine (aka. ileocecal valve region).
- Giardia lamblia is a known trigger, as well as campylobacter (specifically C. jejuni), salmonella, shigella, and various viruses (4, 5).
- Certain toxins are produced by these intestinal pathogens, which alter the levels of normal intestinal cells responsible for moving bowel debris and opportunistic bacteria from the small intestine into the large bowel.
- This situation creates an avenue for either overgrowth of opportunistic intestinal bacteria in the small intestine and/or migration of normal large bowel flora into the small bowel contributing to bacterial fermentation.

Inflammatory triggers are often set in place by these microenvironment shifts in the intestines further exacerbating a dysfunctional bowel and increasing the bacterial colonies and subsequent fermentation of foodstuff leading to the development of SIBO.

## **Treatment Options**

Treatment options of SIBO have mostly focused on antibiotic protocols in attempts to lower opportunistic bacterial colonies. The main antibiotic, Rifaximin, has been useful in certain cases of SIBO because of its effectiveness against various small intestine bacteria and the fact that it has poor intestinal absorption. Rifaximin is also beneficial because it has been reported that it does not contribute to candida overgrowth. A typical dosing schedule for Rifaximin is 550mg three times daily for 10 to 14 days. Another antibiotic called Neomycin has been used in SIBO also and has given some relief of symptoms.

Diet can play a role in SIBO intervention too (6). The main diet used by many health practitioners for SIBO is called the Specific Carbohydrate Diet as described by Elaine Gottschall

in her books “Food and the Gut Reaction” and “Breaking the Vicious Cycle (7).” The basic premise of the SCD is the reduction of various disaccharide foods (aka. complex sugars) which are known to trigger bowel inflammation and excessive mucus production leading to maldigestion. Disaccharide foods include things like grains, starchy vegetables and certain sweeteners such as honey. There is also a SIBO Specific Diet which is helpful too and may be preferred by some people. More information about each diet can be obtained from [www.breakingtheviciouscycle.com](http://www.breakingtheviciouscycle.com) and [www.siboinfo.com](http://www.siboinfo.com), respectively.

In addition to antibiotics and dietary modification, there remains another option for SIBO intervention – *natural remedies*. Whether an individual is using antibiotic therapy or natural remedies, dietary modification with either the SCD or SIBO diet is highly recommended to prevent a return of SIBO.

Certain herbal remedies have been shown to be helpful for SIBO, Bio-Botanical Research provides my clinic with a formula called **Biocidin**® [www.biocidin.com](http://www.biocidin.com). In a 2014 Johns Hopkins Study, many of the active ingredients in Biocidin were shown to be equally if not more effective than the drug Rifaximin in SIBO treatment (8).

Biocidin also contains a variety of other herbs such as Bilberry, Goldenseal, Tea Tree Oil, and Black Walnut all known to assist in bacteria and yeast reduction/elimination.

Biocidin®, as a proprietary blend, comes as either small capsules or liquid with various dosing options. The liquid Biocidin is great for kids and 1 drop/10 lbs. body weight per day, split into three times daily is a good starting point. Adults use between 12-15 drops a day, and increasing dosages may be appropriate based on clinical response. GI Detox+® is a specialized binding agent blend, including silica-laden zeolite, charcoal, and additional adsorptive agents. It is used to assist in the elimination of biotoxins and removal of bacteria, and this combination is especially helpful when any die-off reaction is seen when using Biocidin. Bio-Botanical Research also offers a clinical strength probiotic named Proflora 4R®. Proflora 4R is designed to assist Biocidin in the SIBO reduction while supporting the healing of any intestinal hyperpermeability. It essentially “sets the stage” for beneficial organisms to thrive at the correct level, which makes it an ideal choice for the early stages of SIBO protocol when beneficial strain probiotics can’t yet be added. Proflora 4R does not need to be refrigerated, and adults use just one capsule per day- usually before bed. Those that don’t swallow capsules can take the flavorless capsule contents mixed into water or any other food or beverage they prefer.

Bio-Botanical Research has also received feedback that the Olivirex® formula can be helpful to include, to accelerate the clearance of Archaea in methanogenic SIBO cases. Olivirex is not used in patients under the age of seven but is a common addition to SIBO protocols for adults.

In the first phase of SIBO intervention, Biocidin is a very useful product, as it effectively reduces the bacterial overgrowth in the small intestine, thus reducing the fermentation of carbohydrates. This contributes to an overall improvement in SIBO symptoms by reducing gas, bloating and heartburn. As time progresses and bacteria are further reduced, bowel function returns to normal and overall symptoms are greatly improved. Biocidin, along with GI Detox+ can be used in reduced dosages for ongoing management of SIBO as part of a long-term health support program. Proflora 4R can be added to, or alternated with, beneficial strain probiotics like Culturelle in order to supply ideal levels of beneficial organisms over time.

Kurt N. Woeller, D.O. – Medical Director (Sunrise Medical Center)

951-461-4800 (*phone*)

Practice Website: [www.MySunriseCenter.com](http://www.MySunriseCenter.com)

Practice Email: [SCMedicalCenter@gmail.com](mailto:SCMedicalCenter@gmail.com)

Educational Websites:

- *Integrative Medicine Academy* – [www.IntegrativeMedicineAcademy.com](http://www.IntegrativeMedicineAcademy.com)
- *Autism Recovery System* – [www.AutismRecoverySystem.com](http://www.AutismRecoverySystem.com)
- *Lab Tests Plus* – [www.LabTestsPlus.com](http://www.LabTestsPlus.com).

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