

# Is SIBO A Real Condition?

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## ABSTRACT

**Context** • Small intestinal bacterial overgrowth (SIBO) has gained popularity on the internet in addition to certain clinical and research circles. This interest has expanded awareness of important new dietary, nutraceutical, and pharmaceutical treatments in addition to laboratory evaluation assessment options. Concomitantly, there appears a loss of parsimony regarding how to use these tools resulting in an untenable degree of testing and treatment for this condition.

**Objectives** • A balanced review of the data regarding SIBO testing, treatment, and management with the goal of establishing non-biased best practices.

**Design** • Non-systematic review.

**Results** • The results for the review fall into two categories. Ineffective Action: Treat only SIBO labs; Treat for SIBO if

no symptoms are exhibited; Recommending eating or avoiding foods because they might be good or bad for SIBO; Recommending treatments that are non-validated. Effective Action: Use SIBO breath results, in addition to history and current symptoms, to determine the best treatment; Find foods that work for patients based on dietary elimination and reintroduction; Apply validated treatment for SIBO and IBS in a logical 'step-up' like treatment approach.

**Conclusions** • Testing and treating for SIBO can offer patients clinically significant relief. However, these tests and treatments must be applied with circumspection to prevent over-testing, over-treatment, squandering resources, or creating a fear around certain foods. (*Altern Ther Health Med.* 2019;25(5):30-38.)

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SIBO stands for Small Intestinal Bacterial Overgrowth and occurs from an overgrowth of bacteria in the small intestine. This may cause symptoms associated with IBS (abdominal pain, diarrhea and/or constipation and bloating), food sensitivities, and could possibly cause additional problems such as skin breakouts, fatigue, and depression. SIBO testing involves the use of a breath test, which can be conducted in-home or in a practitioner's office. Recently this concept has been criticized and some have suggested that SIBO is not a real condition.

In light of this, the author aims to provide an updated account of what SIBO is and what it is not, how to test for it, and how to avoid testing pitfalls. And most importantly, how

one can use a SIBO breath test and SIBO treatments to help patients feel better.

This article will review true statements, which will be further supported, incorrect or misunderstood points about SIBO, which will be refuted, and key points, with helpful information on the effective healing of the digestive system.

Firstly, it is important to challenge assumptions and beliefs. In part, because as helpful as natural and functional medicine can be, there is also a tendency to overreact, overdiagnose, and overtreat.

## IMPORTANT CLARIFICATIONS

1. SIBO is not a "condition" in itself, it is, in fact, a lab finding that can underlie the condition of IBS and likely contributes to a number of other conditions such as rheumatoid arthritis, restless leg syndrome, rosacea, fibromyalgia, and non-responsive celiac disease. It seems to increase the risk of, or at least be associated with hypothyroid, weight gain, high blood sugar, and high cholesterol. This is important to understand because some perfectly healthy

people can test positive for SIBO. So a positive SIBO test does not stand on its own.

2. SIBO can fall under a broader umbrella term of digestive tract dysbiosis. Dysbiosis, simply stated, means an imbalance of bacteria, fungus, and other organisms of the digestive system.
3. Treatment of digestive tract dysbiosis, including SIBO, can have far-reaching beneficial effects on conditions such as rheumatoid arthritis, rosacea, thyroid autoimmunity, mood, cholesterol and blood sugar, weight, sleep, and non-responsive Celiac Disease. Support for these points to follow.
4. There is more to digestive health than SIBO. For example, a common SIBO diet called the Low FODMAP diet does more than reduce gas levels and symptoms associated with SIBO and IBS. It also reduces intestinal permeability, inflammation, and histamine (a marker of immune activation in the digestive system). The low FODMAP diet also normalizes serotonin and PYY-producing cell levels in the gastrointestinal tract. These are neurotransmitters which are abnormal in those with IBS, but after the use of the low FODMAP diet become more like that of normal controls.<sup>1-6</sup>
5. IBS is not solely about having too much gas. Some with IBS may have normal gas levels but are hypersensitive to gas pressure. Consequently, they may do better with lower than normal gas levels. Staudacher et al found: "Patients with IBS who developed symptoms on FODMAP challenge did not, in fact, have greater colonic volume than those who do not report symptoms, suggesting that visceral hypersensitivity to luminal distension, rather than increased luminal distension per se, is key to symptom provocation during colonic fermentation."<sup>1</sup>
6. The importance of the small intestine is often overlooked in conversations regarding the health of the microbiota. For example, while a high intake of prebiotics and fiber may be beneficial for the large intestine, this may be harmful to many patients with IBS. This is because these interventions may help the large intestine but irritate the small intestine.

A simple review of the small intestine. It represents over 56% of the digestive tract. Is responsible for 90% of caloric absorption. It contains the largest density of immune cells in the entire body. It is more prone to damage and intestinal permeability than any other part of the digestive system.

#### POINTS OF VALID CRITICISM

**Overdiagnosis of SIBO creates confusion and fear.** It is true that testing is overused and overly relied upon. Diagnoses are often handed out quickly and without adequate substantiation. Patients can be indoctrinated into thinking SIBO is a chronic condition that can not be cleared and will

require lifelong management. This is simply not true for most and is an example of the damage done by overzealousness.

**Not everyone with "SIBO" will require treatment or will have symptoms.** In those with digestive symptoms, there is a range of positivity for SIBO from approximately 4-84%.<sup>7</sup> More conservative estimates suggest 40% of SIBO occurrence in those with IBS. The Rome Foundation concluded that a 30-46% occurrence of SIBO in those with IBS compared to only 4% in healthy controls is more accurate.<sup>8</sup>

While SIBO can cause the symptoms of IBS, it is not guaranteed that it will. If testing is reserved for after foundation therapies, including diet, lifestyle changes, and probiotics, the likelihood that a positive test will require treatment increases. It is important for clinicians to not test overzealously.

However, there are also those patients who only exhibit non-digestive symptoms of "SIBO". Symptoms could include rosacea, restless leg syndrome, high cholesterol, and blood sugar. Additional symptoms could include depression, joint pain, and not responding fully to a gluten-free diet.

Treating SIBO improves:

- Rosacea<sup>9</sup>
- Restless Leg Syndrome<sup>10,11</sup>
- Blood sugar, cholesterol, and potentially weight<sup>12-14</sup>
- Depression (improved by probiotics, which are a SIBO treatment)<sup>15</sup>
- Rheumatoid arthritis<sup>16</sup>
- Non-responsive Celiac disease<sup>17</sup>

A pivotal study illustrates this last concept.<sup>15</sup> Celiac patients were studied who all adopted a gluten-free diet, but still had lingering symptoms. These patients were then tested, and the following was found:

- 2 patients could not digest dairy
- 1 patient had a Giardia lamblia infection and 1 patient had a giant roundworm infection (*Ascaris lumbricoides*)
- 10 patients showed small intestinal bacterial overgrowth (SIBO)

The two patients removed dairy from their diets. Giardia and roundworm were treated with antibiotics in the patients diagnosed with those infections. The ten SIBO patients were treated with a different antibiotic (Rifaximin). A month after treatment, all of these patients were symptom-free.<sup>17</sup> This study clearly illustrates the point that if diet does not work, the next step should be investigating an infection, overgrowth, or imbalance (dysbiosis). This recommendation has been echoed by other researchers as well.<sup>18-20</sup>

**Treating IBS rather than SIBO will likely yield better results.** SIBO is one potential cause of IBS and ill health, however, it is not the only cause. There are many contributing

factors to IBS and problems in the digestive system. Therefore, it is advised to treat IBS, which is broader than SIBO. Better still would be an approach to treat the digestive system holistically and not limit treatments to only SIBO or IBS.

### **Invalid Points of Criticism**

**SIBO treatments are ineffective.** This pointed criticism has occasionally been levied. While it is important to be cautious of overtreatment, this criticism has no merit. Available IBS and SIBO treatments can be quite effective and lead to a wide range of improvements. These improvements often extend beyond the digestive system, as detailed above.

**Researchers have abandoned SIBO.** In fact, 30 studies on SIBO have been published on PubMed from January to March of 2018. Also, two major bodies in gastroenterology, Rome Foundation and the North American Consensus, recently went through the great lengths required to generate consensus statements for the proper use of the SIBO breath test.

**Diets for SIBO do not work & carbohydrates do not have a unique impact upon SIBO bacterial production in the small intestines.** This criticism is again ill-informed and misleading. While it is well known that other compounds impact the microbiome, ingestion of prebiotic and fiber-rich carbohydrate certainly have the greatest impact.

It has been clearly documented that diets restricting carbohydrates that feed bacteria improve SIBO and IBS symptoms. These are known as low FODMAP diets.

A meta-analysis entitled “Does a diet low in FODMAPs reduce symptoms associated with functional gastrointestinal disorders? A comprehensive systematic review and meta-analysis” recently concluded the low FODMAP diet is effective for those experiencing digestive symptoms.<sup>21</sup> Two additional meta-analyses came to the same conclusion.<sup>22,23</sup>

In their recent paper on the low FODMAP diet, Staudacher, et al found: “there are currently at least 10 randomised controlled trials or randomised comparative trials showing the low FODMAP diet leads to clinical response in 50%–80% of patients with IBS, in particular with improvements in bloating, flatulence, diarrhoea and global symptoms.”<sup>21</sup>

As far as non-digestive symptoms are concerned, a SIBO diet (low FODMAP diet) was shown to improve pain and quality of life in those with fibromyalgia.<sup>24</sup> Speculatively, a low FODMAP diet may help even with brain fog. A low FODMAP diet has been shown to lower histamine levels, eightfold.<sup>25</sup> Histamine may cause brain fog when levels are high and is also involved in the allergic response.

**Hypnotherapy is more effective than a low FODMAP.** One study has occasionally been cited as an argument favoring hypnotherapy over a low FODMAP diet. However, citing one paper is not good science and is misleading. Additionally, this is inaccurate, as this study clearly stated that at 6 months, the impact from diet was higher than that of the impact of hypnotherapy.<sup>26</sup>

This is not to disparage hypnotherapy, as hypnotherapy did show substantial benefit in this study. However, making

the statement that hypnotherapy is better than diet for SIBO is an intellectually dishonest statement.

**SIBO violates Koch's postulate, therefore SIBO does not exist.** The criticism has also been levied that SIBO is not valid because it violates Koch's postulate. This is an inaccurate argument, as it is now known that there is an important interplay between the host, one's commensal bacteria, and between one's immune system and a bacteria to dictate whether or not it will be problematic. This is why, for example, malaria has been posited to be at least in part commensal in Sardinia, and then when it was eradicated, a high level of MS ensued.<sup>27</sup> Additionally, why *H. Pylori* may be protective in some and why *Prevotella copri* can act differently in different hosts.<sup>28,29</sup>

**Rifaximin treatment for SIBO has poor efficacy.** The criticism has been raised that the number needed to treat (NNT) of 11 for Rifaximin is poor. NNT simply means the number of people that need to have the treatment before one will benefit. Rifaximin is the most commonly used antibiotic for SIBO and IBS and is FDA-approved to treat diarrheal IBS. It may be true that the results obtained in Rifaximin studies could be better, but to say the treatment is ineffective is misleading.

A recent meta-analysis regarding Rifaximin found the overall eradication rate according to intention-to-treat analysis was 70.8% and the authors concluded that treating SIBO with Rifaximin was safe and effective.<sup>30</sup>

While Rifaximin is not necessarily the best and only option for IBS or SIBO, one should not be discouraged by the criticism of the drug. Rifaximin is used as a monotherapy in these studies, and for only 2 weeks, which may not be adequate duration for more progressed cases. These studies often leave out synergistic interventions such as diet, lifestyle, and probiotics. If nothing else, the antibiotic/Rifaximin studies establish the premise that antibacterial therapy is one efficacious component of SIBO or IBS treatment.

**Most people do not benefit from treatment in the long term.** When looking at drug monotherapy, perhaps. But this paints a very misleading picture of IBS and SIBO long term. Shepherd, et al, found in their study on IBS that the low FODMAP diet benefits 57%–74% of patients at 14–16 months.<sup>31</sup>

In the authors opinion, long-term success can be garnered when the combination of factors that best support the individual's digestive ecosystem is discovered. This includes looking at such factors as diet, lifestyle, probiotics, prebiotic and fiber intake, fasting, and use of herbal antimicrobials. This often means not treating test results, but rather treating patients as an entire person, the digestive system as a unique ecosystem, and assessing the body's response. By combining validated treatments, via a conservative and pragmatic approach, excellent results can be obtained. No published data currently support this precise method, but there is data to support each of these individual components, which together comprise the entire approach.

**There is no consistent standard for SIBO breath testing.** While it is true that there is debate regarding the most effective SIBO breath test, attempts are currently being

**Table 1.** Testing Interpretation Statements

Rome Foundation <sup>8</sup>	North American Consensus <sup>32</sup>
<ul style="list-style-type: none"> <li>• Use the glucose SIBO breath test with a recommended cut off of 10-12 ppm.</li> <li>• Use 50 g of glucose in a 120 minute-test.</li> <li>• Methane testing is not recommended</li> </ul>	<ul style="list-style-type: none"> <li>• A rise in hydrogen of <math>\geq 20</math> ppm by 90 minutes during glucose or lactulose SIBO breath test is considered positive.</li> <li>• Methane levels <math>\geq 10</math> ppm is considered methane positive.</li> </ul>

**Table 2.** Testing Guidelines

Rome Foundation <sup>8</sup>	North American Consensus <sup>32</sup>
<ul style="list-style-type: none"> <li>• Use glucose SIBO breath test, which assesses hydrogen gas.</li> <li>• Reserve this test for populations at risk for SIBO. Specifically, those with certain conditions, including:                         <ul style="list-style-type: none"> <li>o Malabsorption (such as hypochlorhydria)</li> <li>o Anatomical abnormalities</li> <li>o Gastrointestinal motility failure</li> </ul> </li> <li>• Diagnostic value of this test has been assessed as “quite good”, however, the results should be interpreted cautiously and in the context of the patient’s clinical history.</li> </ul>	<ul style="list-style-type: none"> <li>• Breath test should be used in the routine diagnosis of:                         <ul style="list-style-type: none"> <li>o Methane-associated constipation</li> <li>o Evaluation of bloating/gas</li> <li>o Carbohydrate maldigestion</li> </ul> </li> </ul>

made to standardize and increase the accuracy of the testing. The North American Consensus have laid out guidelines to standardize and to prevent overdiagnosis.<sup>32</sup> The Rome Foundation has also laid out guidelines regarding SIBO breath testing.<sup>8</sup> However, not all clinicians have adopted these updates and overdiagnosis and treatment does occur.

If the SIBO breath test is used in the correct way: conservatively and in conjunction with a patient’s history and symptoms, it can be useful. Therefore, it is prudent to never make treatment decisions based upon lab testing alone and why a breath test should not be the final data point dictating treatment decisions.

**SIBO testing does not quantify the number of bacteria in the small intestine.** SIBO breath testing has been shown to correlate with the “gold standard” of duodenal sampling directly from the small intestine. Erdogan, et. al., concluded: “for glucose breath test, the diagnostic yield is lower but there is adequate agreement with culture and a good specificity.”<sup>33</sup>

Another study found similar results: SIBO testing correlated with gold standard testing, and more importantly, subsequent antibiotic treatment improved symptoms, which also matched the breath retesting result.<sup>34</sup> These same findings were not seen in healthy controls, leading this study to conclude that SIBO appears to be a frequent cause of chronic digestive symptoms in children. The breath test provides a simple and noninvasive method of detecting it.

And yet another study found similar results, concluding that the breath test “provides a simple, inexpensive, noninvasive technique to predict the presence of bacterial overgrowth.”<sup>35</sup> That said, the breath test is not perfect and does have valid, published criticism.<sup>36,37</sup>

**SIBO tests are inconsistent & SIBO testing does not correlate with symptoms.** The Rome Foundation, one of the largest and most well-recognized gastroenterology bodies in the world, does feel SIBO testing can be accurate and clinically useful. However, they do take a conservative stance and recommend judicious use of the test. A similar panel of well-recognized experts issued the North America Consensus Statement and also found SIBO breath testing to be accurate and clinically useful; they advise on the more liberal use of the test. There is a brief summary in table 2.

Top authorities around the world weigh in and seem to agree that SIBO breath testing has, at a minimum, a partial role when used conservatively. To come to these conclusions, experts will, in part, look at high-quality studies to craft their opinions.

A high-quality meta-analysis of 11 studies found, “Breath testing was more often abnormal among IBS subjects than healthy controls.”<sup>38</sup>

Some of the studies reviewed in this meta-analysis have documented that breath testing can predict who will respond to antibacterial therapy, and that test results improve as a patient’s symptoms improve. Shah, et. al., found that “In one of these, normalization of the breath test with antibiotics predicted a greater proportion of subject response to treatment. In the other study, subjects responding to the antibiotic rifaximin had a significantly greater reduction in hydrogen compared to non-responders.”

This same meta-analysis concluded, “This study demonstrates that the breath test findings in IBS appear to be valid. While this meta-analysis does not suggest that the breath test findings imply SIBO, the abnormal fermentation

timing and dynamics of the breath test findings support a role for abnormal intestinal bacterial distribution in IBS.<sup>37</sup>

This is not the only meta-analysis to find an association between breath testing results and digestive function.<sup>39</sup> It would be reasonable to say that a positive breath test indicates dysbiosis, or imbalance in bacteria, even if the testing does not perfectly fit the specific pattern of SIBO.

A study is occasionally cited which concluded there was a poor agreement between SIBO testing and those with IBS.<sup>40</sup> However, the study referenced defines a positive SIBO result as a rise in gas within the first 180 minutes, which is incorrect and will, of course, lead to many false positives, thus making the test appear less accurate. In SIBO testing, the cut off time should be 90-100 minutes, rather than 180 minutes. This means that a rise in gas during the first 90-100 minutes of the test could indicate SIBO, but if the rise in gas occurs after 90-100 minutes, it does not indicate SIBO.

**Rapid transit time may cause a false positive SIBO test.** Data clearly show transit can influence test results, this is known and adds nothing new to the discussion. However, there are safeguards that can be taken to minimize the impact of transit time on SIBO breath testing results, which any proficient SIBO clinician will be doing. This includes interpreting lactulose testing conservatively by using a 90 minute cut off, using the correct 10-gram dose of lactulose, which minimizes accelerated transit, or using the glucose test as advised by the Rome Foundation.<sup>41,42</sup>

It is imperative to avoid only treating the test results as false positives can occur, meaning a positive test result can show up in someone who does not require treatment.

**There is no such thing as SIBO.** This is too strong of a statement. While it is true that there is controversy regarding the testing for SIBO, this is likely because not everyone with IBS has SIBO upon breath testing, but rather a subgroup of patients with IBS have SIBO. In a study on breath testing, Parodi, et. al, concluded that “breath testing is useful to identify a subgroup of IBS-like patients, whose symptoms are owing to SIBO.”<sup>43</sup>

Controversy surrounding a subject does not mean it does not exist. Most issues in science are shrouded in controversy. This is how more is learned, resolving the controversies with additional study.

## THERE ARE BETTER TREATMENT OPTIONS THAN ANTIBIOTICS FOR SIBO AND/OR IBS

### Peppermint

As mentioned earlier, diet and natural medicines appear more effective than pharmaceuticals for IBS. However, it is also important not to misrepresent the data solely because of a penchant for natural treatments. It is imperative to be objective and intellectually honest and not biased by philosophical preferences.

Some cite peppermint oil (also known as menthol) as the most effective treatment for IBS, having a number needed to treat of 2 to 3.<sup>44</sup> Peppermint oil is certainly a consideration

and something commonly used in many natural medicine practices. However, it is also important not to overestimate the effectiveness of it.

As a general rule, the smaller the sample size, the more positive the results. The fewer studies on a subject usually equal a lower NNT. The opposite is also true. The more a topic is studied, the higher the NNT tends to become, which is known as positive publication bias. There are only a handful of studies with peppermint, whereas there are closer to 90 with probiotics. The NNT for peppermint is 2-3 and the NNT for probiotics is 8-9.<sup>44</sup> They are both effective, however, considering peppermint more effective than probiotics for IBS or SIBO is extremely misguided.

### Probiotics

It is necessary to mention that the NNT for probiotics is better than most, but not all, of the drug therapies for IBS, and better than fiber. Probiotics can clean bacterial overgrowth and other forms of dysbiosis in the digestive system, such as fungus and parasites. Probiotics have even been shown as effective as antifungal and antiparasitic medication.<sup>45,46</sup>

One study even found that probiotics worked better for those with IBS with SIBO when compared to those with IBS without SIBO.<sup>47</sup> This is likely because probiotics can reduce overgrowths of bacteria. So it is not surprising that the highest-level science, a meta-analysis, showed probiotics can decrease gas levels, SIBO, and relieve some digestive symptoms.<sup>48</sup>

Additional studies on probiotics for SIBO have been done and found a symptomatic improvement of 82% using a probiotic as the only treatment for SIBO patients. This improvement was 30% better than a group of patients being treated with the antibiotic metronidazole.<sup>49</sup>

Another study found a 64% reduction of SIBO gas levels after using 6.5 billion CFU *Lactobacillus casei* Shirota as the only treatment.<sup>50</sup>

And yet another study found a 47% SIBO eradication rate using a dose of 2 billion CFU *Bacillus clausii*.<sup>51</sup>

What are the best probiotics for SIBO? The most efficacious plan of action is to experiment with one of each of the three classes of probiotics.

The three categories are:

1. *Lactobacillus and Bifidobacterium blend*
2. *Saccharomyces boulardii*
3. *Soil-based organisms (select bacillus species)*

### The Low FODMAP Diet

The low FODMAP diet displayed an NNT of 2.2 according to a meta-analysis of clinical trials.<sup>52</sup> There have been roughly 12 studies on the low FODMAP diet, so there is a reasonable amount of evidence in favor of this intervention.

**Table 3. NNT Summary**

Treatment	NNT
Low FODMAP Diet	2.2
Peppermint	2-3 ( <i>likely an overestimation</i> )
Probiotics	8-9
Rifaximin	11
Brain Fiber	30 ( <i>likely an underestimation</i> )

Abbreviations: NNT, number needed to treat.

**Herbal Antimicrobials**

There are fewer studies examining herbal antimicrobials, however, they have been shown effective in IBS and SIBO.<sup>53,54</sup> Herbal antimicrobials work to clean out overgrown or unwanted organisms (dysbiosis) from the digestive system.

In the author’s clinical observation, herbal antimicrobials and probiotics are more curative than peppermint oil and can alleviate symptoms and allow patients to broaden their diet. Many of these herbal medicines also have the side benefits of being anti-inflammatory and perhaps even antidepressants.<sup>55-57</sup>

It is important to address that, speculatively, herbals can also combat imbalances that might not have been detected by testing, such as small intestinal fungal overgrowth, candida, or other bacterial overgrowths like excess hydrogen sulfide bacteria.<sup>58</sup> This is due to the fact that many herbal medicines act against bacteria, fungi, and protozoa at the same time, whereas pharmaceuticals tend to act against just one of these.

**THERE IS HIGH-LEVEL EVIDENCE SHOWING SIBO BREATH TESTING CORRELATES WITH SYMPTOMS.**

High-level data has shown abnormal gas production can be elucidated by breath testing, and more importantly, treatment of this dysbiosis can lead to improvement of symptoms which correlates with retesting results. To clarify, abnormal gas production occurs because of bacterial overgrowth, and bacterial overgrowth is a type of dysbiosis.

A meta-analysis of 11 studies entitled “Abnormal breath testing in IBS: a meta-analysis” found that SIBO breath testing was more often abnormal in those with IBS and this held true irrespective of the definition of SIBO used.<sup>38</sup>

However, it is true that the data is not one hundred percent definitive. This meta-analysis concluded that abnormal bacteria and abnormal breath test findings are valid in IBS, however, it cannot be implied that this is SIBO specifically. This is perhaps due to inconsistency in the diagnostic criteria used in the various studies.

Another meta-analysis of 9 studies entitled “Methane on breath testing is associated with constipation: a systematic review and meta-analysis”, came to similar conclusions. A significant association was found between breath methane levels and constipation.<sup>39</sup>

The authors concluded that breath testing may be useful in identifying those with constipation who should be treated with antimicrobial therapy.

This then begs the important question, does the treatment of SIBO correlate with improved breath test results and with improved symptoms? Affirmatively yes, as evidence has already been covered to support this.

**SIBO RETEST RESULTS CORRELATE WITH RESPONSE TO TREATMENT.**

A clinical trial run by Dr. Mark Pimentel looked to assess if treating SIBO led to improved symptoms and improved SIBO breath testing results. Pimentel et. al, found that 84% of subjects with IBS had SIBO via breath testing, while only 20% of healthy controls had SIBO. Antibiotic treatment led to a 35% improvement, whereas placebo led to an 11% improvement.<sup>59</sup> The best outcomes occurred in those treated who also saw a normalization of their breath test. This especially reinforces the connection between SIBO breath test results and symptoms. The authors concluded that normalization of the breath test leads to a significant reduction in symptoms.

Another study found that SIBO breath testing correlated with symptoms and did so more accurately than the gold standard of duodenal aspirates.<sup>60</sup> In this study of ill patients, a lactulose SIBO breath test found SIBO, whereas the direct sampling did not. When the patients were treated with antibiotics, their symptoms improved and so did their SIBO breath tests. This likely indicates that the SIBO was out of sampling reach, meaning the SIBO was further down the intestinal tract than could be reached by the sampling device.

And in yet another study titled “Positive glucose breath testing is more prevalent in patients with IBS-like symptoms compared with controls of similar age and gender distribution”, it was found that SIBO breath testing was more often positive in patients with IBS and that subsequent treatment of SIBO lead to both improved symptoms and improved breath test results.<sup>43</sup>

It is also important to note that most of this data is regarding antibiotic treatment alone. The criticism is occasionally made that the level of improvement from antibiotic treatment is not impressive. While that may be true, it does not mean that antibiotic or herbal antimicrobial therapy is ineffective. Rather, it means that this is one of several treatment modalities that can be used together to achieve optimum results.

This is not a novel concept in medicine. A stand-alone drug or herb is usually less effective than using said treatment in conjunction with dietary and lifestyle changes. This argument would be akin to stating that if adrenal supporting herbs do not lead to a near 100% resolution of fatigue, they are ineffective. It would be inaccurate to suggest the only intervention for someone who is tired would be Ashwagandha. It may help, but for optimum results, the patient should also be eating sufficient calories, following a healthy diet, exercising, obtaining adequate sleep, and managing stress.

While it has been established that post-treatment SIBO re-testing results tend to match symptomatic improvements, it is not necessary to continually re-test when treating SIBO. It is acceptable to use an approach that is exclusively guided by symptoms. This was supported by a systematic review in 2008 in which the authors concluded that the most practical method was to test and then treat until the patient feels well.<sup>61</sup> Keep in mind this was ten years ago and we have sharpened our understanding regarding the SIBO breath test considerably since then.

### **BEST USE OF SIBO BREATH TESTING.**

In the author's clinic, patients are typically tested to obtain a baseline, but only in patients who have already taken some initial steps toward improving their digestive health but are not feeling better. This often means someone has tried at least one diet or one type of healing intervention such as probiotics. If one has not attempted this, it may be helpful to start with those basic interventions before testing at all. However, if someone has already taken these steps and is still not feeling well, then a SIBO breath test is performed. Once the test is performed, there are two likely treatment paths:

Path one:

- Treat until an optimal symptomatic response is achieved
- Once achieved, there is optional confirmatory re-testing

Path two:

- If optimal symptomatic improvement is not achieved after multiple treatment attempts, re-test to see how patient's SIBO status correlates with their current condition to guide future treatment

This approach is reasonable because it is as effective as a more testing heavy method, but it can be argued that it produces results faster, since less time is allocated for retesting, and more affordable, because less testing expense is incurred.

### **Altered transit may be caused by SIBO and may be improved by SIBO treatment.**

While abnormal transit can skew the results of a breath test, it is known that bacterial overgrowth and the subsequent increased production of hydrogen and methane gas can alter transit, and specifically alter small intestinal motility. This is likely part of the reason why treatment of overgrowth can normalize breath testing results because it can normalize transit. Here is this concept summarized.

- *Abnormal bacteria (SIBO) = altered transit = abnormal breath test*
- *Normalized bacteria (from treatment) = normalized transit = normalized breath test*

The paper "Methanogens, methane and gastrointestinal motility" provides some important insights. Triantafyllou et

al, conclude that "While a causative relation (constipation + methane) is not proven yet, there is strong evidence from animal studies that methane delays intestinal transit, possibly acting as a neuromuscular transmitter."<sup>62</sup>

This evidence is further supported by the universal finding that methane production (measured by breath test) is associated with delayed transit time in clinical studies. More importantly, it has been shown that treatment of the SIBO gas leads to improvement in transit times. The above is supported by several other studies.<sup>39, 63-67</sup>

However, there is also some data showing gas does not affect motility or transit time.<sup>68-71</sup>

### **There is a balance to be struck between conventional and natural medicine when it comes to IBS (gas, bloating, abdominal pain, constipation and/or diarrhea).**

On the one hand, it is prudent for a patient to keep their conventional doctor apprised of their situation so they can obtain care in a timely fashion. On the other hand, it is important not to overreact and prematurely seek out imaging studies, endoscopies, and the like, which can be costly, unpleasant, and invasive.

There are some simple, safe, and natural interventions that could eliminate the need for a more costly and invasive evaluation. In studies that compare natural to pharmaceutical treatments for IBS, it is fairly clear to see that, overall, natural therapies work better than pharmaceuticals.<sup>44</sup> Drugs have a place in the treatment of IBS, but this is one area where diet and natural medicine appear superior.

### **CONCLUSION**

One of the most prevalent problems in healthcare is not "starting with the gut", and skipping over this foundational aspect of one's health. Instead, pursuing things that are better addressed after optimizing the health of the digestive system. This would include areas like adrenal health, hormones, detoxification, Lyme disease, and mold.

SIBO breath testing is not perfect nor are the treatment options for IBS, but when used correctly, they can be very effective. It is also important to remember that many non-digestive symptoms such as fatigue, depression, insomnia, skin issues, and potentially thyroid autoimmunity and metabolism may improve after optimizing one's digestive health.

#### **Ineffective Action:**

- Treat only SIBO labs
- Treat for SIBO if no symptoms are exhibited
- Recommend eating or avoiding foods because they might be good or bad for SIBO
- Recommend treatments that are non-validated
- Encourage patients to avoid conventional medicine completely

#### **Effective Action:**

- Use SIBO breath results, in addition to history and current symptoms to determine the best treatment

- Find foods that work for patients based on intuitive understanding and bodily reaction
- Apply validated treatment for digestive health in a logical sequence of steps
- Encourage patients to keep conventional doctor informed, but hopefully not need any treatment after using natural interventions

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