SIBO
Root Causes

A Comprehensive Guide to
Exploring the Underlying Causes of
Small Intestinal Bacterial Overgrowth

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VEXA

In a Nutshell

What is SIBO?
(Small Intestinal Bacterial Overgrowth)

- **Definition.** SIBO is a condition characterized by an excessive amount of bacteria in the small intestine.

  Unlike our colon, our small intestine is not supposed to harbor a large number of microorganisms. When it does, these organisms cause excess production of gases like methane, hydrogen, hydrogen sulfide.

- **Symptoms.** SIBO can cause digestive symptoms like bloating, gas, abdominal pain, diarrhea, constipation, unintentional weight loss, and loss of appetite, as well as systemic symptoms such as brain fog, joint pain, fatigue, restless leg syndrome, hormonal alterations, and skin problems.

Did you know?

In SIBO, the bacterial overgrowth is not a root cause of the condition. Rather, it is a result of the underlying pathology, which can be food poisoning-mediated gut dysfunction, impaired gut motility, insufficient digestive enzymes, the effects of certain medications, post-surgical changes, etc.

SIBO vs. IMO vs. SIFO

Intestinal Methanogen Overgrowth (IMO) is a subtype of SIBO where there is an excess of methane-producing archaea in the small intestine and colon.

Small Intestinal Fungal Overgrowth (SIFO) is also a subtype of SIBO, involving an excess of fungi in the small intestine.

SIBO
Root Causes

In this guide, we delve into the most common root causes of SIBO. Recognizing these underlying factors is essential for effective treatment, as addressing symptoms alone may lead to recurrence if the root causes remain unaddressed.

While relying solely on medications like rifaximin to resolve SIBO can be effective in treating bacterial overgrowth, it's important to recognize that SIBO is frequently rooted in issues of gut motility.

Motility means the ability to move—the ability of the digestive system to move food along the gastrointestinal tract. When this process is disrupted and food doesn't pass through the small intestine at the appropriate pace, it creates an environment conducive to the overgrowth of microorganisms, leading to SIBO.

By understanding and addressing gut motility, we can take a more comprehensive approach to managing SIBO and reducing the risk of recurrence.

Food Poisoning

Food poisoning, typically caused by bacterial pathogens like *Campylobacter, Salmonella, E. coli,* or *Shigella*, can set the stage for the development of SIBO. While food poisoning is distressing on its own, for certain individuals, it can have long-lasting consequences.

One significant mechanism linking food poisoning to SIBO involves the production of specific antibodies in response to bacterial toxins. Mark Pimentel, a leading SIBO researcher at the Cedars-Sinai Medical Center, highlights the role of anti-CdtB and anti-vinculin antibodies, which can emerge following an episode of food poisoning.

These antibodies target proteins like vinculin, disrupting normal gut motility and contributing to the development of SIBO.

In essence, the presence of specific bacterial toxins and the resulting immune response can lead to lasting changes in gut function, paving the way for SIBO to develop.

PPI Overuse

Proton pump inhibitors (PPIs) such as Nexium (Esomeprasole), Prilosec (Omeprazole), Prevacid (Lansoprazole) and Protonix (Pantoprazole) are commonly prescribed to treat acid reflux and GERD (GORD). However, long-term use of these drugs can have significant consequences, particularly for the small intestine.

One major effect of long-term PPI use is the disruption of normal gut motility. PPIs work by suppressing stomach acid production, which is crucial for moving food and bacteria through the gut.

Without enough acid, motility is impaired, allowing bacteria to linger and multiply in the small intestine. Additionally, reduced stomach acid alters the microbial environment, promoting bacterial overgrowth.

While a short course of PPIs (up to 4 weeks) is generally safe, prolonged use can lead to several issues that may contribute to the development of SIBO.

Cervical Instability

Cervical spine instability involves excessive movement or misalignment of the neck vertebrae, potentially leading to compression/irritation of nearby nerves, like the vagus nerve.

The vagus nerve regulates stomach acid secretion and food movement in digestion. When cervical spine instability compresses it and causes inflammation, digestion is disrupted.

This disruption can lead to gastroparesis, where the stomach struggles to empty, increasing the risk of bacterial overgrowth in the small intestine.

Additionally, cervical spine instability can decrease stomach acid production, resulting in gut dysmotility and overgrowth of bacteria in the small intestine.

Another consequence of cervical instability is pyloric valve dysfunction. This valve controls the passage of food from the stomach to the small intestine. When dysfunctional, food retention in the stomach can occur, increasing the risk of SIBO.

Hyperglycemia

Hyperglycemia, or high blood sugar levels, is a significant root cause to consider in SIBO development.

Research indicates a significant association between diabetes and SIBO, with about 75% of diabetics exhibiting SIBO. This is because uncontrolled diabetes or chronic hyperglycemia can lead to neuropathic gastric and small intestinal dysmotility.

Additionally, nearly half of diabetic patients with chronic diarrhea have been found to have SIBO. Also notable: individuals with type 2 diabetes have a 50% reduction in vagal nerve girth compared to healthy individuals.

And since the vagus nerve plays a crucial role in regulating gut motility, compromised vagal nerve function due to high blood sugar levels can disrupt normal digestive processes, potentially leading to SIBO. Addressing hyperglycemia through dietary and lifestyle modifications may be crucial in managing and preventing SIBO in individuals with hyperglycemia.

Hypothyroidism

Hypothyroidism, characterized by low thyroid function, is a prevalent condition affecting approximately 5% of the general population and nearly 10% of women.

While constipation is a well-known symptom of hypothyroidism, it's important to note that low thyroid function can also slow down the movement of the small bowel.

Research suggests a complex relationship between hypothyroidism and SIBO, involving poor GI motility and impaired stomach acid secretion.

Thyroid hormone influences the stomach's hydrochloric acid production. Therefore, individuals with hypothyroidism may develop hypochlorhydria (lower stomach acid levels) or achlorhydria (no hydrochloric acid production).

This, combined with gut dysmotility, creates the perfect storm for SIBO development.

Chronic Stress

Our ancestors faced stress in short, intense bursts—like encountering predators or other immediate threats. Today, however, our stress is often more insidious and chronic, stemming from modern pressures and ongoing challenges.

This prolonged stress, whether from work, relationships, or other sources, can significantly impact our physiology, including our gut health. Chronic stress disrupts the normal movement of our gut, triggers an overactive immune response, throws off hormonal balance, and can contribute to conditions like SIBO.

Moreover, chronic stress weakens our immune system, leaving our gut more vulnerable to bacterial overgrowth and inflammation, both of which can fuel the development of SIBO.

By implementing stress management techniques, seeking support through therapy, and making lifestyle adjustments, we can restore harmony to the gut-brain connection and reduce the risk of SIBO.

Deficiencies

Nutritional deficiencies play a significant role in the development of SIBO through various mechanisms.

Iron deficiency can lead to anemia, triggering inflammation and harming gut motility. Similarly, deficiencies in vitamins B6, B9 (folate), B12, and C, as well as copper, can also contribute to anemia and inflammation, further exacerbating motility issues.

Thiamine (Vitamin B1) is essential for vagus nerve function, which plays a crucial role in regulating digestive processes. Additionally, vitamins D and A, along with zinc, are vital for immune health, which is essential for regulating bacteria.

Furthermore, adequate stomach acid is crucial for preventing SIBO. Nutrients such as magnesium, chloride, potassium, zinc and iodine are required for adequate stomach acid production.

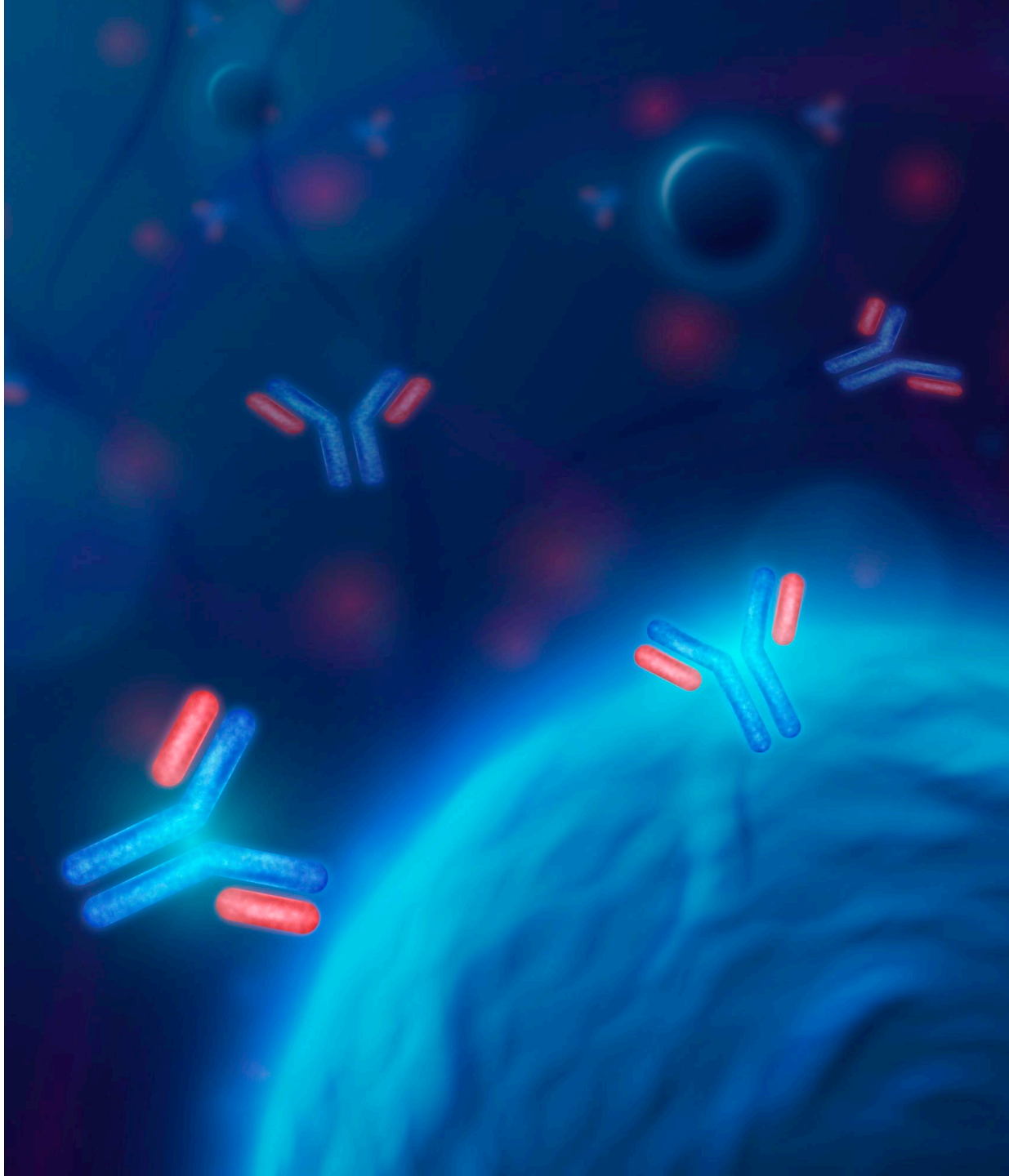
Addressing nutritional deficiencies through balanced diet and supplementation is essential for supporting overall gut health and reducing the risk of SIBO.

Autoimmunity

Autoimmune diseases, like Celiac disease, Hashimoto's thyroiditis, Multiple Sclerosis, Grave's disease, Rheumatoid Arthritis, and Systemic Lupus Erythematosus (SLE), often have significant implications for gut health. The inflammatory processes involved in autoimmunity can disrupt normal gut function, potentially leading to dysmotility and SIBO.

Researchers believe that the inflammation associated with autoimmune diseases may contribute to dysmotility and the development of SIBO. For example, in the context of Hashimoto's thyroiditis, the autoimmune attack on the thyroid gland can lead to hypothyroidism, which, as discussed earlier, is associated with poor gut motility and increased risk of SIBO.

Understanding and addressing autoimmunity in the context of SIBO management is essential for developing effective treatment strategies. By addressing the root cause of inflammation and immune dysregulation, it may be possible to improve gut motility and reduce the risk of SIBO.



Antibiotic Overuse

While it may seem counterintuitive, antibiotic overuse can actually contribute to the development of SIBO rather than alleviating it. While antibiotics are designed to kill harmful bacteria, they can also disrupt the delicate balance of bacteria in the gut, leading to dysbiosis.

Antibiotics are highly effective at targeting and killing bacteria, but they are not selective in their action. Alongside harmful bacteria, antibiotics can also deplete beneficial bacteria in the gut, creating an environment conducive to the overgrowth of potentially harmful species. Furthermore, repeated or prolonged antibiotic use can lead to antibiotic resistance, making it even more challenging to treat bacterial overgrowth in the future.

Therefore, while antibiotics may be necessary in certain cases to treat bacterial infections, their overuse or misuse can disrupt gut microbiota and increase the risk of SIBO.

Other Health Disorders

Several health disorders have been linked to an increased risk of SIBO due to their effects on gut motility, immune function, and overall digestive health.

Multiple sclerosis (MS) can affect the nervous system, including the nerves that control gut function, leading to dysmotility and increasing the risk of SIBO.

Autism spectrum disorder (ASD) is often associated with gastrointestinal symptoms, including altered gut motility and dysbiosis, which can contribute to the development of SIBO.

Parkinson's disease affects the autonomic nervous system, impairing gut motility and leading to constipation and bacterial overgrowth in the small intestine.

Gastroparesis, a condition where the stomach empties slowly, creates an environment where bacteria can thrive. Other health conditions, such as fibromyalgia and ME/CFS are also linked to SIBO.

Other Medications

Several medications can contribute to dysbiosis or SIBO through various mechanisms affecting gut motility, the gut-brain axis, neurotransmitter release, and more.

Antacids, such as Tums, can alter stomach acidity and impact digestion, potentially disrupting the balance of gut bacteria. Anticholinergic drugs, like Toviaz, can interfere with nerve signaling in the gut, affecting motility and bacterial balance.

Certain antidepressants (e.g., Elavil and Norpramin) may slow gut motility, while antihistamines such as Benadryl can affect neurotransmitter release and gut function.

Blood pressure medications like calcium blockers, dopamine agonists such as Mirapex and Requip, and illicit drugs like cocaine and LSD can all have effects on gut motility/dysbiosis.

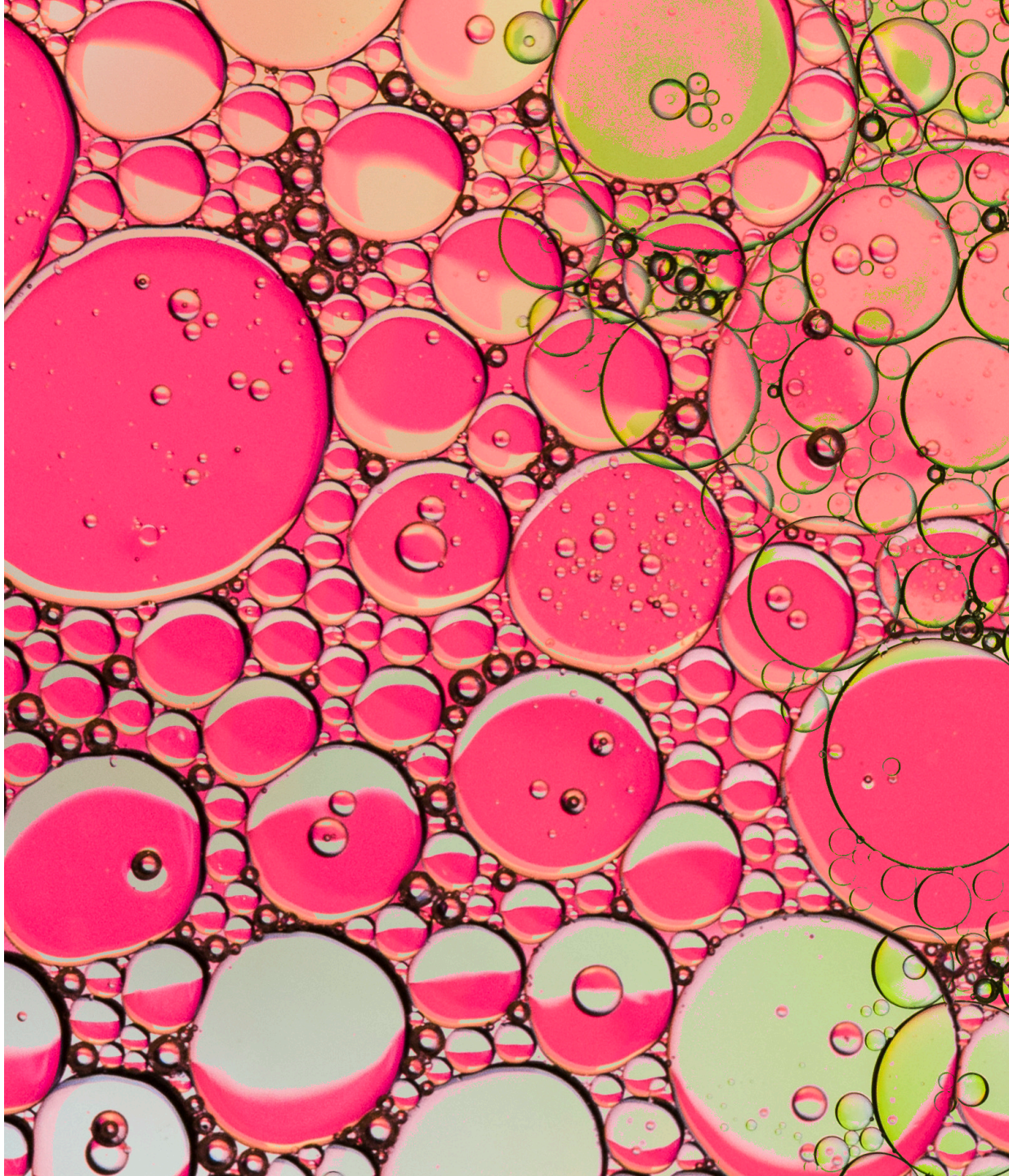
Nausea medications like Zofran, NSAIDs such as ibuprofen and Motrin, and cholesterol-lowering statin drugs like Lipitor may also impact gut function and bacterial balance.

Structural issues

Structural issues within the gastrointestinal tract, such as those related to gastric surgery, fistulas, adhesions, and diverticulosis, can significantly affect gut motility and contribute to the development of SIBO.

Surgery or the presence of adhesions, which are types of scar tissue, in the stomach or small intestine can create pockets that allow food and bacteria to accumulate, increasing the risk of bacterial overgrowth. Similarly, issues in the colon, such as fistulas, adhesions, or diverticulosis, may enable bacteria from the large intestine to migrate back into the small intestine.

Adhesions and scar tissue can restrict mobility and impair the movement of bowel contents, further exacerbating the risk of bacterial overgrowth. This phenomenon is observed in various conditions, including endometriosis, systemic sclerosis connective tissue disease, and Ehlers-Danlos syndrome, as well as following abdominal surgeries such as gallbladder or appendix removal.



Exposure to Toxins

Exposure to toxins in our environment, such as pesticides, bisphenols, phthalates, and metals, can have profound effects on gut health and contribute to the development of SIBO.

These toxicants disrupt hormonal balance, place stress on the liver, impair the nervous system—including the vagus nerve—and alter our gut microbiota. Chronic Inflammatory Response Syndrome (CIRS), for instance, triggers a significant inflammatory response that can disrupt gut motility and perpetuate mast cell activation.

Lyme disease and moldy buildings are also common, both exposing individuals to toxins that can disrupt gut function and increase the risk of SIBO development.

To address SIBO in the context of toxin exposure, it's crucial to minimize exposure to environmental toxins as much as possible, while supporting liver detoxification pathways and address underlying inflammation.

Dietary Imbalance

Dietary imbalances can significantly impact gut health and contribute to the development of SIBO. Consuming too many ultra-processed foods (UPFs), which are often high in unhealthy fats, sugars, and additives, can disrupt the balance of gut bacteria and promote dysbiosis.

A diet low in fiber and polyphenols can also negatively affect the gut microbiome. Fiber is essential for maintaining healthy gut motility and providing nourishment for beneficial gut bacteria. Polyphenols (found in fruits, vegetables, beverages like tea and red wine) have antioxidant properties that support a healthy gut environment. When these vital nutrients are lacking, it can lead to an imbalance in the gut microbiota and create favorable conditions for bacterial overgrowth.

Additionally, disordered eating patterns, such as restrictive diets, binge eating, or irregular meal timing, can further disrupt gut function and microbial balance. They can lead to poor gut motility and nutrient absorption, increasing the risk of SIBO.

Gut Health Dietitian

Feeling overwhelmed trying to manage your SIBO with bits of information from all over the internet?

Struggling with restrictive diets, endless supplements, and still not seeing the results you want?

As a registered dietitian specializing in metabolic and gut health, I can help you navigate your journey to better gut health.

With expertise in the gut microbiome, I'll work with you to create a personalized plan that fits your lifestyle and addresses your unique needs.

Head on to VEXA SIBO Specialization for details.

Wishing you the best of health.

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