

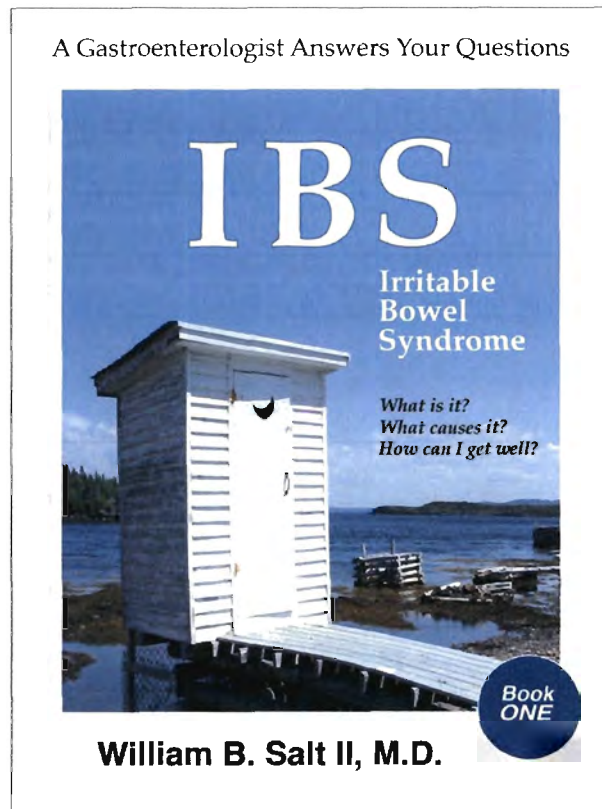
SIBO

Small Intestinal Bacterial Overgrowth

associated with

Irritable Bowel Syndrome and

“Gas”: Bloating, Distention, and Flatulence



www.IBSAnswersForYou.com

*Adapted and expanded from the book and including
the latest science-based research on diagnosis and treatment*

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Advisory

This educational offering is provided to inform patients and facilitate a shared and participatory patient-doctor relationship. It is not intended as a medical manual. The information provided is designed to assist the reader in making informed decisions regarding health. It cannot serve as a substitute for consultation with a medical doctor. The author recommends that you be aware of your condition and seek competent medical help before you begin any health program, including making dietary changes and undertaking an exercise plan.

Background

This educational offering discusses the latest science and research-based understanding of SIBO diagnosis and treatment. It is based upon the pioneering research and practice of gastroenterologist, Mark Pimentel, MD, Director GI Motility Program, Cedars-Sinai Medical Center in Los Angeles, California. It is also based upon information presented at a SIBO Symposium held January 18-19, 2014 in Portland, Oregon (www.SIBOSymposium.com). While the symposium featured Dr Pimentel, additional SIBO expert presenters included gastroenterologist, Leonard Weinstock, MD, Associate Professor of Clinical Medicine, Washington University in St. Louis and President, Specialists in Gastroenterology (www.GIDoctor.net) and naturopathic doctors Steven Sandberg-Lewis and Allison Siebecker of the SIBO Center for Digestive Health at the National College of Natural Medicine in Portland, Oregon (www.SIBOinfo.com).

What is IBS?

The symptoms of IBS are abdominal pain or discomfort associated with bowel dysfunction (diarrhea, constipation, or both). There are two main subtypes of IBS: diarrhea predominant (IBS-D) and constipation predominant (IBS-C). However, many patients with IBS have variable bowel function and stool consistency and cannot be clearly classified as either IBS-D or IBS-C. This subtype is IBS-M (mixed). Many people develop IBS following acute food poisoning (infectious gastroenteritis). This is post-infectious IBS (IBS-PI).

As explained in the ebook from which this educational offering is adapted (www.IBSAnswersForYou.com), IBS is a complex “functional” disease of how the body works (dysfunction) involving the GI tract (GUT), the mind/brain (HEAD), and their interactions (the CONNECT). IBS is the most common functional GI disorder, or FGID (www.RomeCriteria.org). Other FGIDs commonly occur with IBS, including heartburn and upper abdominal pain that do not respond to strong acid reducing medication. Medical tests (blood tests, x-rays, scans, and colonoscopy) usually do not show the dysfunction of IBS and other FGIDs.

Is “gas” an IBS symptom?

Most patients with IBS have associated “gas” symptoms. Gas symptoms include:

- Abdominal bloating
- Abdominal distention (actual enlargement of the belly, especially after eating and often progressively worse as the day progresses)
- Flatulence (farting), which can be smelly (malodorous)

Can IBS and SIBO occur together?

Most patients with IBS and “gas” also have SIBO (small intestinal bacterial overgrowth), or IBS/SIBO, which may be contributing to symptoms, diagnosed with a breath test, and treated. SIBO is caused by a disease or disorder, the most common of which is IBS.

What is SIBO?

SIBO refers to alterations in types, numbers, and/or location of the many different bacteria that live in the small intestine. Bacteria are found throughout the GUT, and the new term for this resident population is “microbiome.” The microbiome plays an important role in both digestive as well as overall health.

Normally, the upper small intestine (duodenum) contains no bacteria. Bacteria increasingly populate the small intestine below the duodenum (jejunum), but the numbers of bacteria in the

lower small intestine (ileum) are still much lower than within the colon. The colon is normally loaded with bacteria, which make up one-half of the volume of stool.

The main source of food for bacteria in the small intestine is carbohydrate, which worsens and perpetuates SIBO. The bacteria ferment carbohydrates, which releases gas (hydrogen, methane, and hydrogen sulfide). SIBO can result in GUT inflammation and damage. When the GUT is abnormally sensitive and motility or peristaltic function is disturbed as it is in IBS and “gas,” SIBO can cause or contribute to pain and symptoms.

Patients are increasingly interested in SIBO. Many self-medicate with over-the-counter probiotics, herbals, and botanicals. Many consult with alternative health practitioners, particularly if they cannot find a physician knowledgeable about SIBO. Many physicians consider SIBO and recommend that the patient take a probiotic and/or treat with antibiotic without basing management upon the latest science and research.

New understanding of SIBO is a bridge between allopathic and naturopathic medicine, which informs and empowers both patients and caregivers:

- The definition of SIBO has been refined.
- SIBO is associated with many diseases of the GUT.
- *The most common disease associated with SIBO is IBS (IBS/SIBO).*
- Testing for SIBO has been validated (hydrogen breath testing).
- Allopathic treatment methods for SIBO have been developed.
- Naturopathic therapy of SIBO may be helpful.

Why does IBS/SIBO occur?

Dysfunction of the migrating motor complex (MMC) in the small intestine is responsible (Figure 1).

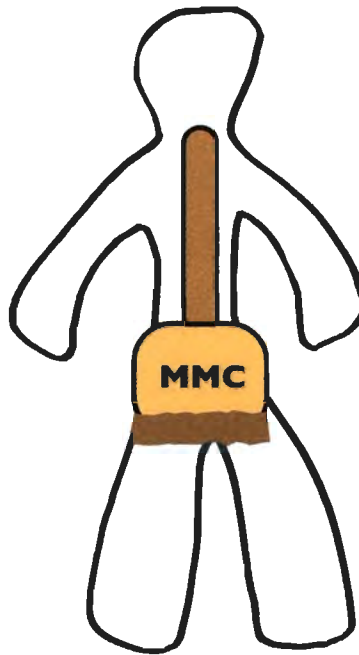


Figure 1

The migrating motor complex (MMC) of the small intestine is like a broom and “housekeeper of the GUT.” It cleans the small intestine during fasting, sweeping the intestinal contents (including bacteria) into the colon about every 90 minutes during fasting. Dysfunction of the MMC occurs in most patients with IBS, especially if abdominal bloating and distention are associated symptoms. The MMC is deactivated by eating, stress, opioid therapy, and certain GUT infections. As a result of dysfunction of the MMC, SIBO occurs with bacterial fermentation of carbohydrate.

Can IBS/SIBO start after acute food poisoning?

It is common for IBS to begin following acute infectious gastroenteritis. While there are several causes of IBS, new research has shown that many patients develop IBS as a consequence of acute infectious gastroenteritis (food poisoning). Common bacterial causes include *Campylobacter*, *Salmonella*, *E. coli*, and *Shigella*. This is called, IBS-PI (post-infectious). Patients may not recall this unless the doctor asks about it.

The infection makes a toxin, and some people make an antibody to attack and neutralize it. After the infection has been eliminated, the antibody remains in case the body encounters the toxin again. A protein in the wall of the small intestine called “vinculin” helps maintain normal GUT nerve and MMC function. The toxin made by the infection has some similarity to this protein (vinculin). So the toxin is fooled, sees the protein as the toxin, and attacks it. (This process of the body attacking itself is called, “autoimmunity.”) This antibody attack on the GUT protein affects normal GUT function and can cause IBS pain and symptoms. Impairment of the MMC

with loss of the sweeping action of bacteria into the colon can result in SIBO. Sometime within the next year, a blood test will become available to detect this anti-vinculin antibody and help with the diagnosis of IBS.

IBS is a functional GI disorder, or FGID (www.RomeCriteria.org). Other FGIDs that commonly occur with IBS, including heartburn and upper abdominal pain that do not respond to strong acid reducing medication can also can be triggered by food poisoning/infectious gastroenteritis.

What else besides IBS can cause SIBO?

SIBO is not an independent diagnosis, because something causes it (most commonly IBS). Other causes include surgery (bariatric with gastric bypass, blind loops, and removal of the ileocecal valve between the small intestine and colon), partial small intestinal obstruction (adhesions or Crohn's disease), small intestinal diverticulosis (much less common than diverticulosis of the colon), and opioid (narcotic) use. Furthermore, SIBO often occurs along with other diseases, such as celiac disease, inflammatory bowel disease (Crohn's disease and ulcerative colitis), pancreatic disease, and liver disease. How is SIBO diagnosed?

How is IBS/SIBO diagnosed?

When IBS and gas symptoms consistent with IBS are present, an attempt is made to identify the predominant IBS bowel symptom and whether "gas" is present; then a hydrogen breath test is conducted.

IBS SUBTYPE

IBS is abdominal pain or discomfort associated with bowel dysfunction (diarrhea, constipation, or both). IBS treatment depends somewhat upon the subtype, which is based upon the predominant bowel symptom: diarrhea (IBS-D) or constipation (IBS-C). While diagnostic criteria for these subtypes are available, many patients with IBS have a variable bowel pattern and do not fall neatly into one subtype. When the IBS subtype is unclear, as is often the case, it is classified as mixed (IBS-M). Patients with IBS-M note considerable variation in bowel consistency and pattern over hours to days. Some patients actually transition from one subtype to another over weeks to months, which is called alternating (IBS-A).

"GAS"

Regardless of subtype, most patients with IBS are troubled by "gas," with abdominal pain, bloating, and flatulence, even though "gas" is not currently considered a component of the definition of IBS. Typically, bloating and distention occur after meals and become progressively severe as the day progresses.

THE HYDROGEN BREATH TEST

Research by Dr. Mark Pimentel and Cedars - Sinai Hospital shows that the hydrogen breath test is very helpful in diagnosis of IBS/SIBO, classification, and treatment. A hydrogen breath test kit from Commonwealth Laboratories Inc. (www.HydrogenBreathTesting.com) is used for SIBO diagnosis. The patient takes the kit home, performs the breath test, and mails it to the laboratory in a postage paid box for analysis. Figure 1.2 describes how the test works.

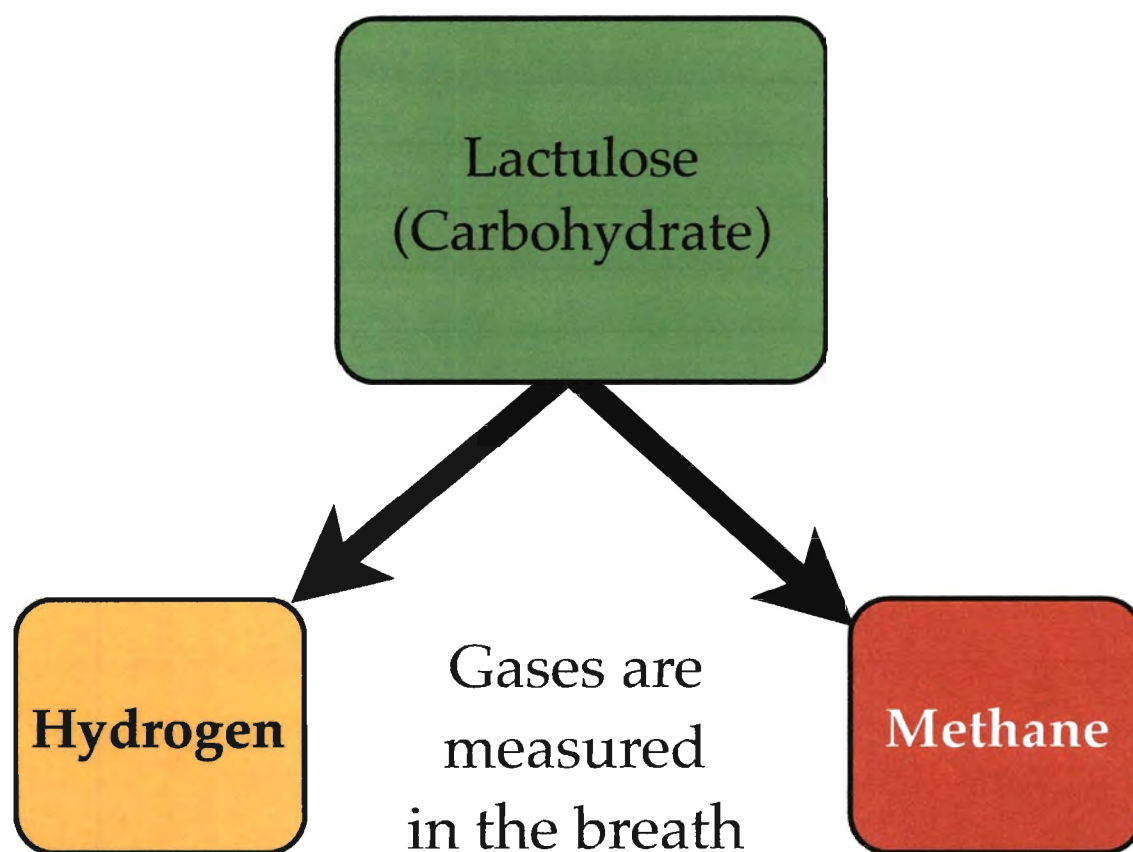


Figure 1.2

When SIBO is present, small intestinal bacteria break carbohydrates down into hydrogen. About 1/3 of people have small intestinal organisms (methanogens) that can make methane from hydrogen. Hydrogen and methane are colorless and odorless gases absorbed into the blood stream and then expired in the breath. After ingesting a substrate packet of a carbohydrate called lactulose, the patient produces breath samples collected in special tubes every 20 minutes over a 3-hour period.

Elevated levels of breath hydrogen are evidence of SIBO, which is found in most patients with IBS. Detection of methane in the breath is associated with constipation, because methane slows colon motility and peristalsis.

Hydrogen breath testing is about 90% accurate in diagnosing IBS/SIBO, but it is not a perfect test. For example, hydrogen breath testing does not detect hydrogen sulfide, which is made by certain bacteria that break down sulfur-containing foods and is responsible for smelly gas. Furthermore, methane is not always detected. By contrast, a positive test for SIBO does not assure that treatment will be effective. For example, the bacteria may not be sensitive to the antibiotic treatment.

A caveat: SIBO cannot currently be diagnosed with stool tests. Some laboratories make misleading claims that SIBO and “dysbiosis” can be detected by stool testing. Analysis of stool bacteria does not reflect small intestinal bacterial overgrowth. Furthermore, half of the bacteria in the stool are dead rather than alive as they are in the small intestine.

Hydrogen breath test results assist in diagnosis and treatment of SIBO. Most patients with IBS have an abnormal hydrogen breath test (IBS/SIBO). Furthermore, IBS/SIBO can be categorized as IBS/SIBO without methane production and IBS/SIBO with methane production. IBS/SIBO without methane production is treated with a unique antibiotic called, Xifaxan. IBS/SIBO with methane production is treated with Xifaxan plus another antibiotic. Hydrogen sulfide responsible for smelly gas (malodorous flatulence) is not detected by breath testing. Treatment is similar to that for IBS/SIBO with methane.

How is IBS/SIBO treated?

SIBO is best treated with one or two antibiotics. A special diet that restricts certain carbohydrates necessary for prevention of SIBO relapse is not recommended during the treatment phase, because it is important that bacteria within the small intestine are actively feeding on carbohydrates, rather than starving and attempting to protect themselves. The bacteria are more susceptible to antibiotic therapy when feeding upon the typical carbohydrate-rich diet.

Xifaxan is a unique antibiotic that has been found in research and clinical practice to be the most effective treatment for IBS/SIBO. Many gastroenterologists prescribe Xifaxan off-label for IBS/SIBO. (“Off label” refers to the common practice of prescribing an approved drug for an unapproved disease, such as IBS, or unapproved age group, dose, or form of administration.) Xifaxan is awaiting FDA (Food and Drug Administration) approval for treatment of IBS-D, which is likely to occur in 2014. Most antibiotics are absorbed by the GUT and then circulated throughout the body. Very little Xifaxan is absorbed (0.4%). It

remains in the GUT and treats SIBO directly. So the risk of side effects with Xifaxan is minimal. Furthermore, antibiotic resistance does not occur.

Xifaxan is taken for 10 to 14 days. Treatment included 14 days in research, but 10 days is usually effective and reduces cost (personal communication with Dr Pimentel). It is very important to complete the entire course of therapy and to take the Xifaxan three times a day. Taking Xifaxan twice a day instead of three times a day reduces likelihood of success by 30%.

The treatment decision for IBS/SIBO and whether to use Xifaxan alone or Xifaxan combined with another antibiotic is based upon both the predominant symptoms and results of the hydrogen breath test.

IBS/SIBO WITHOUT METHANE

Typically, the IBS subtype here is IBS-D. IBS/SIBO without methane is usually treated with Xifaxan alone: 550 mg taken by mouth *three* times a day with or without food for 10 - 14 days.

IBS/SIBO WITH METHANE (SOMETIMES, METHANE IS NOT DETECTED)

Typically, the IBS subtype is IBS-C or IBS-M. Methane slows colon motility (peristalsis). Treating IBS associated with methane production successfully can be more difficult and requires the use of both Xifaxan and another antibiotic. Furthermore, an additional course of treatment may be necessary.

Antibiotics are given in combination for treatment of IBS/SIBO associated with methane production: Xifaxan 550 mg taken by mouth *three* times a day with or without food for 10 - 14 days **PLUS** another poorly absorbed antibiotic called, neomycin. Neomycin dosage is one 500 mg tablet taken by mouth *twice* a day with or without food for 10 - 14 days.

Side effects of neomycin are uncommon, because less than 3% of the drug is absorbed (nausea, vomiting, diarrhea). Neomycin taken for this short time cannot damage either the kidneys or the ears, which is only an uncommon risk when taken for many weeks.

A less studied alternative to neomycin is metronidazole. The dose of metronidazole taken in combination with Xifaxan is either 250 mg taken by mouth with food three times a day for 10 - 14 days or 500 mg taken by mouth with food twice a day for 10 - 14 days. Since metronidazole is absorbed, possible side effect risks include nausea, vomiting, diarrhea, indigestion, metallic taste, and furry tongue. Other side effects are possible, but they are rare.

Diagnosis of IBS-C/SIBO has not yet been incorporated into The American Gastroenterological Association (www.Gastro.org) Medical Position Statement on Constipation (2013) that can be read online, [http://www.gastrojournal.org/article/S0016-5085\(12\)01545-4/fulltext](http://www.gastrojournal.org/article/S0016-5085(12)01545-4/fulltext).

IBS/SMELLY GAS - MALODOROUS FLATULENCE (THE BREATH TEST CAN BE NEGATIVE, SINCE HYDROGEN SULFIDE IS NOT DETECTED)

Smelly gas is caused by bacteria that make hydrogen sulfide from hydrogen and sulfur containing foods. The current hydrogen breath test does not detect hydrogen sulfide and is often “flat,” detecting little if any hydrogen.

Treating with the IBS/SIBO two drug Xifaxan/neomycin regimen may be effective. Avoid sulfur-containing foods, including red meat (the prime offender), cruciferous vegetables (broccoli, cabbage, brussels sprouts, and cauliflower), garlic, dried and sulfured fruit (e.g., apricots), certain aromatic spices, and beer (for unexplained reasons).

Can other antibiotics be used?

The Xifaxan-based regimen, with or without neomycin is the most effective of all available. The Cedars-Sinai/Dr. Pimentel protocol does not treat SIBO with absorbable antibiotics, other than to consider substituting metronidazole for neomycin when treating IBS-C/SIBO if neomycin cannot be used or side effects occur. If Xifaxan cannot be given for financial or other reasons, SIBO expert, gastroenterologist Leonard Weinstock will consider treatment with both neomycin (500 mg twice daily) and metronidazole (500 mg twice daily) for 10 days, but the regimen may not be as effective.

What if I don't respond to treatment?

There are several possibilities if response to treatment is either incomplete or absent. These include failure to follow the regimen correctly and consistently, treating with Xifaxan only twice a day rather than three times a day, failure to include neomycin if methane is present in the hydrogen breath test or a false negative is suspected based upon constipation, presence of bacteria resistant to the treatment, proton pump inhibitor (PPI) treatment, opioid (narcotic) treatment, the small intestinal disease or condition underlying SIBO is too severe, and that the symptoms are not caused by SIBO.

It may be necessary to repeat the hydrogen breath test to clarify whether SIBO is still present. Re-treatment may be necessary, particularly with IBS-C/SIBO when the original hydrogen breath test level of methane is high, declines, but remain abnormal. Allison Siebecker recommends adding allicin to the IBS-C/SIBO regimen (derived from crushed garlic cloves and conversion of allin by the enzyme allinase to allicin) for its antibacterial effects. The dosage of allicin ranges from 180 - 450 mg three times a day for 30 days. Allicin can prolong bleeding time, affect absorption of a tuberculosis drug called, isoniazid, and reduce blood levels of reverse transcriptase inhibitors.

A two to three week course of an elemental diet, including only water and Vivonex Plus (Nestle Health Science: www.nestlehealthscience.us) has been shown in research by Dr Pimentel to be highly effective therapy for SIBO. A cheaper alternative to Vivonex is a home made

mixture developed by Allison Siebecker (www.SIBOinfo.com). The cheapest regimen is a water fast. Symptoms usually respond within 1 - 2 days, so trying an elemental diet or water fast can be a helpful diagnostic test for SIBO.

Elemental diet is not very palatable. Steps to take that may help tolerability include creating a slurry with ice, flavoring with Crystal Light (Kraft Foods, www.kraftbrands.com), and sipping the concoction through the day.

The full treatment regimen should be conducted under a doctor's supervision. Since there is no eating of food for the 2 - 3 week course of treatment, weight loss is common, which can be dangerous for those of low weight. Vivonex is expensive, and insurance may not cover the cost. The website includes links to several online vendors.

Herbal and botanical antibiotics can be considered (refer to earlier discussion of allicin and later discussion regarding botanicals/herbals).

What if SIBO relapses?

Unfortunately, most patients who respond to SIBO treatment eventually relapse, so it is important to take several steps to reduce relapse risk with dietary changes and medication. If relapse is rapid, within a month or so, then the doctor may order tests to evaluate the small intestine for abnormalities, which are detected in about one half of such patients (for example, Crohn's disease, small intestinal diverticulosis, and partial small intestinal obstruction).

If SIBO relapse occurs, then Xifaxan-based treatment can be repeated. Dr Pimentel's research show that beneficial effect is not lost with retreatment.

What can be done to prevent SIBO relapse?

SIBO usually relapses following treatment unless several preventative steps are taken, the most important of which involve meal timing, diet, and medication.

MEAL TIMING

It is very important to space meals 4 - 5 hours apart and to avoid snacking between meals and after going to bed for the night. The MMC cleans the small intestine in the fasting state. It is inactivated by eating.

DIET

Dietary changes are essential in SIBO prevention, but there is no test to determine each person's best diet. Trial and error is involved. Remember that dietary changes are made AFTER taking treatment. Carbohydrates are the main food source for the small intestinal bacteria. So carbohydrates feed the bacteria and worsen SIBO, and the bacteria ferment the carbohydrates, releasing gas.

There are four diets that can be used. Common to all the diets are:

- Carbohydrate restrictions
- Allowance of protein (eggs, meat, poultry, seafood)
- Allowance of fat
- Avoidance of indigestible substances: sugar alcohol sweeteners (polyols), including mannitol and sorbitol and also ucralose (brand name is Splenda)

(Hydrogen breath testing for lactose and fructose carbohydrates can be conducted).

Cedars-Sinai Low Fermentation Diet

This is the easiest diet developed by gastroenterologist, Mark Pimentel, MD intended to prevent SIBO relapse.

The diet allows grains refined as wheat (gluten) and rice and also starchy vegetables, so it is not a low carbohydrate diet. It avoids dairy and beans.

- **Sweeteners:** avoid corn syrup (including non-diet soda), mannitol, sorbitol (often found in gum), sucralose (Spenda), lactose, lactulose. Acceptable sweeteners are glucose, sucrose (table sugar), and aspartame (Equal or NutraSweet)
- **Dairy:** these products are best avoided initially because of lactose content. Lactrase containing enzymes and/or lactose-free milk can be used.
- **Soy:** some people find that soy products are not tolerated.
- **Fruit juice:** limit food and food products sweetened with fruit juice, which contains fructose.
- **“High residue” foods:** limit or eliminate beans (kidney beans, garbanzo beans, pinto beans, etc.), lentils, and peas (including split pea soup).
- **Fruits:** can be eaten in moderation (no more than 2 servings a day). Fruits contain fructose, which is fermentable. Dried fruits concentrate the fructose and should be limited.
- **Vegetables:** fresh, non-starchy vegetables are healthy foods. Consider eating 3 - 5 cups of cooked vegetables daily. Cooked or lightly steamed vegetables are preferable to raw vegetables, because they are easier to digest and absorb. Avoid large salads with raw vegetables.
- **Potatoes, pasta, rice, bread, and cereals:** these are acceptable, although some people need to limit gluten-containing foods (wheat, pasta, bread, cereals). This is trial and error. Some people have non-celiac gluten sensitivity. While they do not have celiac disease, they feel better in their GUT and overall when they restrict or avoid gluten containing foods.

RESOURCE:

Pimentel, Mark. A New IBS Solution: Bacteria - The Missing Link in Treating Irritable Bowel Syndrome. The book website is: <http://anewibssolution.com>

Weinstock, Leonard. Diet for IBS and SIBO. www.GIDoctor.net.

Specific carbohydrate diet (SCD)

This diet was created for diseases with diarrhea: celiac disease, inflammatory bowel disease, and IBS-D.

The Specific Carbohydrate Diet is grain free, starchy vegetable free, and low fiber (low carbohydrates). It permits fructose and high fermentable vegetables and fruit that the low FODMAPS diet restricts. It includes an introductory diet intended to mimic the elemental diet. The diet begins with foods easier to digest and progresses with foods as tolerated.

RESOURCES:

<http://breakingtheviciouscycle.info>

Gottschall, Elaine. *Breaking the Vicious Cycle: Intestinal Health Through Diet* (book)

www.SCDlifestyle.com

www.SIBOinfo.com

Low FODMAPS diet

FODMAPS is an acronym for **F**ermentable **O**ligosaccharides, **D**isaccharides, **M**onosaccharides, And **P**olyols. The diet was created for IBS symptom relief. It allows gluten-free grains, starchy vegetables, and polysaccharide fiber. Thus, it is not actually a low carbohydrate diet and directed to management of SIBO.

RESOURCES:

Sue Shepherd, Ph.D. and Peter Gibson, M.D. *The Complete Low-FODMAPS Diet* (book).

www.thelowfodmapdiet.com.

Sue Shepherd's website:

<http://shepherdworks.com.au/disease-information/low-fodmap-diet>

Patsy Catsos, RD, website and book: *Free at Last*. <http://www.ibsfree.net>

Kate Scarlata, RD, website: <http://blog.katescarlata.com>

SCD + low FODMAPS diet

This diet was developed by Allison Siebecker and combines the best features of both The Specific Carbohydrate Diet and low FODMAPS diet. The base is the Specific Carbohydrate Diet. Then low FODMAPS foods are added in as tolerated. It was created for relief of SIBO symptoms, and the introductory phase of the Specific Carbohydrate Diet is optional.

RESOURCE:

Allison Siebecker developed this diet, which is available on the web : www.SIBOinfo.com.

MEDICATION

Drug therapy is essential in SIBO prevention. Three drugs are available that have “prokinetic” effects on the MMC. This means that they can promote improved MMC function.

Erythromycin

While erythromycin is an FDA-approved antibiotic, it is used here off-label for its effects on the MMC and not for its antibiotic effects. Erythromycin is taken in very low dosage by mouth daily at bedtime (1/4 of a 250 mg tablet). A 250 mg tablet is prescribed, and a pill-cutter is used to divide the tablet into quarters. Side effects of erythromycin with this regimen are uncommon and the benefit of the drug is not lost over time.

Resolor (prucalopride)

This drug is approved for the treatment of IBS-C and constipation in many countries, including Canada and it is likely that it will soon be FDA approved in the United States. Until then, health insurance will not pay for Resolor, which is expensive. It can be obtained through Canadian pharmacies and through compounding pharmacies in the United States. A low dose (usually 1/2 to 1 mg) is taken by mouth at bedtime.

Naltrexone

This drug is FDA approved for treatment of opioid addiction and alcohol dependence and also has anti-inflammatory effects. A very low dosage is taken by mouth each night (1.5 mg to 5 mg), which is much lower than necessary to treat addiction and dependence. Low dose naltrexone is prepared by a compounding pharmacy. Potential side effects of low dose naltrexone include insomnia, nausea, headache, abdominal pain, muscle aches, rash, dizziness, fatigue, and dizziness. It may help starting with 1.5 mg. If the drug interferes with sleep, it can be taken 4 - 5 hours before going to bed and then gradually moved closer to bedtime after adjusting to the drug.

XIFAXAN

If necessary, Xifaxan can be given continuously. Dr Pimentel recommends 550 mg every other day.

What else can be done to prevent SIBO relapse?

Several steps may be helpful.

REDUCE OR ELIMINATE PROTON PUMP INHIBITORS (PPIs)

Stomach acid kills most ingested bacteria. Strong acid reducing drugs called proton pump inhibitors (PPIs) can promote SIBO. Examples include Prilosec (generic name is omeprazole), Nexium, Prevacid (generic name is lansoprazole), and Protonix (generic name is pantoprazole). Many patients with chronic heartburn can reduce dosage or frequency of PPIs or switch to much less potent acid reducing drugs called H2RA (histamine-2 receptor antagonists). Examples of H2RAs include cimetidine (Tagamet), ranitidine (Zantac), and famotidine (Pepcid). **It may not be possible to prevent SIBO relapse if PPIs are continued.**

OPIOIDS (NARCOTICS)

These drugs can cause or contribute to SIBO by causing dysfunction of motility and peristalsis. **It is usually not possible to prevent SIBO relapse if narcotics are continued.**

DIET

Dietary changes are essential in SIBO prevention, but there is no test to determine each person's best diet. Trial and error is involved, so it may be necessary to try different diets.

INTESTINAL PERMEABILITY (“LEAKY GUT”)

Dr. Leonard Weinstock suggests consideration of a 1 month course of therapy with a zinc carnosine and L-glutamine combination (EndoZin, Klaire Labs: www.Klaire.com), EnteraGam (serum derived bovine immunoglobulin protein isolate, Entera Health: www.Enteringam.com), or InflammACORE (Ortho Molecular Products, www.orthomolecularproducts.com).

STRESS MANAGEMENT

Stress interferes with normal function of the MMC. A good self care plan can help (healthy diet, exercise, weight control, proper sleep, and specific stress management strategies).

BOTANICALS AND HERBALS

Certain botanical/herbal medications have antibiotic and inflammatory effects and can be considered. Most of the research of these agents has been done in laboratory tests and in animals rather than in clinical trials involving humans. Naturopathic physicians may recommend them, and they are available in health food stores. These include: berberine containing herbs, garlic (*Allium sativum*), Neem (*Azadirachta indica*), and Oregano (*Origanum vulgare*).

RESOURCES:

www.SIBOinfo.com

Allison Siebecker and Steven Sandberg-Lewis. Small Intestine Bacterial Overgrowth: Often-Ignored Cause of Irritable Bowel Syndrome. Townsend Letter, February/March, 2013: www.TownsendLetter.com.

Can probiotics help treat or prevent SIBO?

Probiotics are microorganisms that may confer a health benefit on the host, and many people take them. Lactic acid bacteria and bifidobacteria are the most common types of microbes used in probiotics. Very little is known about using probiotics to manipulate GUT bacteria for health. Over 500 different bugs live in the GUT, and it is unlikely that any one probiotic will prove to be of benefit in treating and preventing SIBO. At the current time, probiotics for either treatment or prevention of SIBO are not recommended here.

“Probiotics: A Consumer Guide for Making Smart Choices” is available by the International Scientific Association for Probiotics and Prebiotics, or ISAPP (www.ISAPP.net). The guide

advises that there are five criteria consumers should consider when selecting a probiotic: probiotic strain, proof, packaging, quality, and quantity.

Use of probiotics to treat IBS/SIBO is trial and error, and if the decision is made to try them, they should be taken for at least one month before a judgement is made about response to treatment. Based upon research, 5 probiotics may help improve IBS symptoms (Activia yogurt for constipation, Align, Culturelle, Florastor, and VSL#3).

Can I stop preventative treatment?

Most patients with SIBO who respond to treatment will eventually relapse if preventative management including diet with prokinetic medication is discontinued. Some patients may elect to stop treatment after 6 - 24 months to see if symptoms return. About one half of patients who develop SIBO following food poisoning eventually recover. Fortunately, retreatment will be as successful as initial therapy.

Can enzymes help?

Three enzyme supplements may help digest certain triggering carbohydrates, which can reduce "gas."

Lactase (beta galactosidase) Lactase is the enzyme that digests lactose (milk sugar). Lactase treated milk can be purchased. Lactase enzyme supplements are available without prescription.

Alpha amylase is contained in pancreatic enzyme medications used to treat certain pancreatic diseases. These drugs require a prescription and can be used off-label as an IBS-D treatment alternative. Two such drugs are Zenpep and Creon. These drugs also contain a fat digesting enzyme, called "lipase" that can be helpful if fat malabsorption is also present. Alpha amylase containing products can be purchased without a prescription and identified on the web by searching the National Institutes of Health Dietary Supplement Label Database.

Beano (alpha-galactosidase) is a dietary supplement that breaks down polysaccharide and oligosaccharide carbohydrates in foods, especially raffinose. Beano can help prevent gas and abdominal discomfort from beans, vegetables, and whole grains. It is necessary to take Beano before eating as a preventative.

Conclusion

IBS is usually associated with SIBO (IBS/SIBO), which can be detected with hydrogen breath testing. When SIBO is present, successful treatment can relieve IBS and "Gas" symptoms.