

SIBO
Small Intestinal Bacterial Overgrowth

A Common Imbalance in the Gut Microbiome - Clinical Pearls for Diagnosis and Treatment



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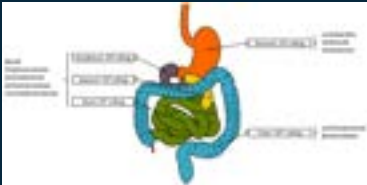


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Definition

When you hear the term SIBO - think about Dysbiosis - an imbalance of gut flora, and/or disturbance in the gut terrain

- SIBO - an abnormal growth of colonic bacteria in the small intestine, and/or type of organisms present



Reference: Achutis, T, et al. Small Intestinal Bacterial Overgrowth: Comprehensive Review of Diagnosis, Prevention, and Treatment Methods. *Gastro*. 2020 Jun; 12(6).

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SIBO - Prevention

Anatomical and physiological protective barriers that prevent or prohibit small intestinal bacterial overgrowth include:

- Stomach acid, Bile, Pancreatic enzymes
- MMC (migrating motor complex)
- Intestinal mucosa
- Commensal flora
- Secretory IgA
- Ileocecal valve

References:
Dures, J et al. Small intestinal bacterial overgrowth syndrome. World Journal of Gastroenterology, 2010 Jun 26; 16(24): 2978-2990.

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SIBO - Symptoms

- Bloating
- Constantly feeling full
- Constipation
- Diarrhea
- Alternating constipation/diarrhea
- Fullness
- Abdominal pain
- Heartburn
- Belching
- Flatulence
- Nausea



References:
Pan, S., Bhagatani, J. Small Intestinal Bacterial Overgrowth: Clinical Features and Clinical Management. *Clinical And Translational Gastroenterology*. 2019, Oct; 10(10).
Pimental, M., et al. ACG Clinical Guideline: Small Intestinal Bacterial Overgrowth. *The American Journal of Gastroenterology*. 2019. [doi:10.1093/ajg/114.10.1700](#)

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SIBO - Causes and Predisposing Factors

- Medications
 - PPI's (suppress stomach acid production)
 - Antibiotics (disruption to microbiome)
 - Opioids (can lead to constipation)
 - Anti-Cholinergics (can lead to constipation)
- Surgery (adhesions, strictures), radiation to abdomen
- Hypochlorhydria/Achlorhydria
- Connective Tissue Diseases (e.g. EDS, scleroderma)
- Diabetic autonomic neuropathy
- IBS and IBD (Crohn's Disease)
- Ileocecal Valve Impairment
- Gastroparesis
- Diverticulosis
- Liver cirrhosis
- Dysfunction of MMC (migrating motor complex)
- Stress (think Vegas nerve and sympathetic overdrive)

References:
Wassenaar, E., and Adler, J. Small Intestinal Bacterial Overgrowth: Comprehensive Review of Etiology, Prevention, and Treatment Methods. *Cureus*. 2020, Jun;12(6).
Sachdev, A., and Pimental, M. Gastrointestinal bacterial overgrowth: pathogenesis and clinical significance. *Pharmacologic Advances in Chronic Disease*. 2013 Sep; 4(3): 223-231.
Pimental, M., et al. ACG Clinical Guideline: Small Intestinal Bacterial Overgrowth. *The American Journal of Gastroenterology*. 2019. [doi:10.1093/ajg/114.10.1700](#)

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SIBO - Associated Conditions

- IBS
- IBD
- Celiac
- Hypothyroidism
- Acne
- Eczema
- Rosacea
- Hepatic Encephalopathy
- NAFLD
- Rheumatological conditions
- Obesity
- Parkinson's Disease
- Chronic pancreatitis
- Restless Leg Syndrome

References:
Liu, G., et al. Small Intestinal Bacterial Overgrowth and Irritable Bowel Syndrome: A Bridge Between Functional Organic Dysmotility. *Gut and Liver*. 2013 Mar; 11(2): 186-208.
Burgoyne, D., Cooper, M., Hovvema, B., and Cooper, S. Small Intestinal Bacterial Overgrowth and Irritable Bowel Syndrome. *Journal of Intensive Care Medicine*. 2000 May; 15(5): 303-311.
Pan, S., Bhagatani, J. Small Intestinal Bacterial Overgrowth: Clinical Features and Clinical Management. *Clinical And Translational Gastroenterology*. 2019, Oct; 10(10).
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SIBO Testing

Gold standard is aspirated fluid from small intestine (high cost, invasive procedure). Very rare clinically to ever see this test done.

Breath testing - Most accessible and noninvasive form of testing available. Many different labs and doctor's offices run this test, and can now conveniently be done at home. NOT a perfect test.

- Lactulose (10 g) (lower specificity, however, covers entire small intestine)
- Glucose (75 g) (high specificity, low sensitivity)

Breath testing prep - VERY important

- o Will want to avoid certain medications weeks before test including antibiotics. Avoid motility agents like loperamide a few days before test.
- o Prepping the day before test is essential - avoid all fermentable complex carbohydrates and fiber containing foods/beverages. Okay to eat fat and protein rich foods like eggs, beef, chicken, fish, leafy greens, olive oil, and non-starchy vegetables (e.g. spinach, kale, lettuce, green peppers, cucumbers, zucchini). No alcohol.
- o Fast with only water the morning of the test.

False positive and false negatives are not uncommon, so make sure clinical picture fits.

References:
Muller-Liss, A. and Adler, J. Small Intestinal Bacterial Overgrowth: Comprehensive Review of Diagnosis, Prevention, and Treatment Methods. *Cureus*. 2020; Jun; 12(6): e12015.
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Mazza, V., Muscarelli, T. Diagnosis by Montreal Criteria: Small Intestine Bacterial Overgrowth and Treatment of Small Intestine Bacterial Overgrowth. *Journal of Clinical Gastroenterology*. 2020; 54(10): 1000-1005.
Pimentel, N. et al. RUC: Clinical Guidelines: Small Intestinal Bacterial Overgrowth. *The American Journal of Gastroenterology*. 2020; 115(10): 1603-1613.

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SIBO - Testing cont.

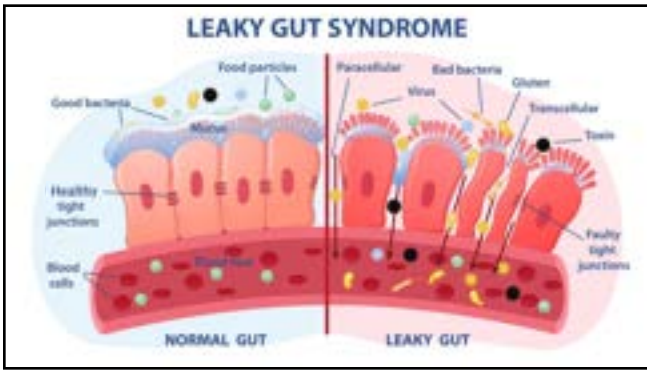
Do you need to test in order to treat SIBO?

- Not necessarily, especially if going to use probiotic, elemental diet, low FODMAP diet, or herbal approach, but knowing hydrogen and methane levels can help direct treatment options. For example, if methane positive you generally see constipation, and use of neomycin antibiotic, or compounds like garlic or Atrantil are more helpful for lowering methane levels.

If you do test and then re-test post treatment and can monitor percentage of reduction in gas levels

Guidelines vary tremendously around when and if to re-test - some say immediately after treatment, and some say no need if symptoms improve

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SIBO - Treatment

Probiotics

Low-Fodmap Diet

Elemental Diet, and/or Elemental shakes

- Physicians Elemental Diet
- Elemental Heal

Anti-microbial herbs - 2014 Johns Hopkins clinical trial used Dysbiocide and FC Cidal, and Candibactin AR and Candibactin BR

- MANY to choose from: Berberines, Pau D' Arco, Olive leaf extract, Artemesia, Oregano oil, Thyme Oil, Neem extract, Garlic, etc.

Pharmaceutical Anti-biotics (rifaximin/Xifaxan, neomycin, metronidazole)

Prokinetics

- Pharmaceutical - low dose Erythromycin, Prucalopride/Motegrity, LDN (Low Dose Naltrexone).
- Natural - Iberogast and ginger (both clinically studied as prokinetics)
 - Other commonly used formulas include Motil-Pro, SIBO-MMC, and Motility Activator

References:
 Park, S. et al. Probiotics for Preventing and Treating Small Intestinal Bacterial Overgrowth: A Meta-Analysis and Systematic Review of Current Evidence. *Journal of Clinical Gastroenterology*. 2017. April;51(4):500-511.
 Park, S., Bhatnagar, S. Small Intestinal Bacterial Overgrowth: Clinical Features and Clinical Management. *Clinical and Experimental Gastroenterology*. 2018. Oct. 19(10): 181-191.
 Shalaby, M., Whalen, Y. "Low-FODMAP diet" reduces abdominal bloating and discomfort in irritable bowel syndrome. *Alimentary Pharmacology and Therapeutics*. 2013. Oct. 19(10): 181-191.
 Pimental, N. et al. Rifaximin Reduces Small Intestinal Bacterial Overgrowth. *The American Journal of Gastroenterology*. 2008. <http://ajg.physicianselementaldiet.com>

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Anti-microbials	Prokinetics	Herbs	Other
Rifaximin (Xifaxan)	Erythromycin	Berberine	Elemental Diet
Neomycin	Prucalopride (Motegrity)	Oregano Oil	Low FODMAP Diet
Metronidazole	LDN (Low Dose Naltrexone)	Artemisia	Physicians Elemental Diet
		Thyme Oil	Elemental Heal
		Garlic	
		Neem	
		Pau D'Arco	
		Olive Leaf Extract	
		Thyme	
		Peppermint	
		Peppermint Oil	
		Peppermint Leaf	
		Peppermint Seed	
		Peppermint Bark	
		Peppermint Tea	
		Peppermint Candy	
		Peppermint Gum	
		Peppermint Ice Cream	
		Peppermint Liqueur	
		Peppermint Sauce	
		Peppermint Syrup	
		Peppermint Tincture	
		Peppermint Vinegar	
		Peppermint Wax	
		Peppermint Soap	
		Peppermint Shampoos	
		Peppermint Conditioners	
		Peppermint Lotions	
		Peppermint Creams	
		Peppermint Oils	
		Peppermint Balms	
		Peppermint Salts	
		Peppermint Powders	
		Peppermint Tablets	
		Peppermint Capsules	
		Peppermint Gummies	
		Peppermint Chews	
		Peppermint Drops	
		Peppermint Sprays	
		Peppermint Candles	
		Peppermint Incense	
		Peppermint Essential Oils	
		Peppermint Carrier Oils	
		Peppermint Blends	
		Peppermint Recipes	
		Peppermint DIYs	
		Peppermint Crafts	
		Peppermint Art	
		Peppermint Games	
		Peppermint Activities	
		Peppermint Exercises	
		Peppermint Stretches	
		Peppermint Yoga	
		Peppermint Meditation	
		Peppermint Mantras	
		Peppermint Affirmations	
		Peppermint Journaling	
		Peppermint Coloring	
		Peppermint Puzzles	
		Peppermint Trivia	
		Peppermint Facts	
		Peppermint History	
		Peppermint Culture	
		Peppermint Traditions	
		Peppermint Folklore	
		Peppermint Superstitions	
		Peppermint Myths	
		Peppermint Legends	
		Peppermint Stories	
		Peppermint Songs	
		Peppermint Music	
		Peppermint Movies	
		Peppermint TV Shows	
		Peppermint Books	
		Peppermint Comics	
		Peppermint Games	
		Peppermint Toys	
		Peppermint Fashion	
		Peppermint Accessories	
		Peppermint Home Decor	
		Peppermint Furniture	
		Peppermint Lighting	
		Peppermint Textiles	
		Peppermint Bedding	
		Peppermint Bath Products	
		Peppermint Skincare	
		Peppermint Haircare	
		Peppermint Nails	
		Peppermint Makeup	
		Peppermint Fragrances	
		Peppermint Candles	
		Peppermint Incense	
		Peppermint Essential Oils	
		Peppermint Carrier Oils	
		Peppermint Blends	
		Peppermint Recipes	
		Peppermint DIYs	
		Peppermint Crafts	
		Peppermint Art	
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		Peppermint Toys	
		Peppermint Fashion	
		Peppermint Accessories	
		Peppermint Home Decor	
		Peppermint Furniture	
		Peppermint Lighting	
		Peppermint Textiles	
		Peppermint Bedding	
		Peppermint Bath Products	
		Peppermint Skincare	
		Peppermint Haircare	
		Peppermint Nails	
		Peppermint Makeup	
		Peppermint Fragrances	

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SIBO - Treatment

- Biofilm busters (for more stubborn cases)
- Digestive enzymes and HCL
- Supporting Bile Flow
- Demulcent herbs (post SIBO treatment)
- Glutamine (post SIBO treatment)
- Immunoglobulins (IgG/Colostrum), Peptides (BPC-157)

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Case Study

-34 yo female with 8 year history of IBS/SIBO symptoms - bloating, abdominal discomfort/cramping, constipation.
-Terrible quality of life - looks pregnant all the time, exercise is uncomfortable, constipated
-HPI: Age 25 had endometriosis surgery - soon afterward developed GI symptoms likely due to formation of adhesions
-Surgeon dismissive of symptom development, said bloating and constipation unrelated to surgery
-PCP suggested SIBO breath test - It was positive. Tried a round of Xifaxin (14 days) with no improvement in symptoms
-I took her on as a patient and suggested she buy an AIRE 2 device for at home testing - revealed significant elevation in hydrogen and methane gas elevations in early morning even with a 12 hour overnight fast!

Started her on the following:

- Low Fodmap diet
- Digestive enzymes with meals
- ADP - Oregano oil. Anti-microbial.
- Biocidin capsules. Anti-microbial - mild biofilm buster.
- Advanced Biofilm Phase II. Biofilm buster.
- LDN - Low Dose Naltrexone. Pro-kinetic effect.
- Iberogast at night before bed. Herbal pro-kinetic.
- Smooth move tea. Herbal laxative.
- Castor oil packs. Anti-inflammatory, can help with constipation.
- Gupta Program for Limbic System retraining
- Meditation and deep breathing exercises - to help promote parasympathetic activity, and vagal tone

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Case Study

1 month later - mild improvement including less bloating and improved energy, but still symptomatic.

New treatment plan:

- Rifaximin (1650 mg/day and neomycin 1000 mg/day) - 14 day course. Then...
- Continue to take, but reduce dose of - ADP, Biocidin, and Advanced Biofilm Phase II
- Add on Atrantil (developed by a gastroenterologist to reduce methane producing organisms (archaea)
- Switch out Iberogast for Motilpro (a different prokinetic with ginger as main ingredient)
- Referral for abdominal massage to help work on adhesions from endometriosis surgery.
- Continue with Gupta Program and meditation/breathing practice

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Case Study

1 month later (2 months from initial visit) -

- Overall symptoms are significantly improved, but still has some lingering bloating post meals. She sent me a picture of her flat abdomen.)
- Feels like Motilpro really helps with motility - in the future may try Prucalopride/Motegrity for stronger effect
- Maintenance dose of anti-microbials - Atrantil, Biocidin. May switch up formulas if SIBO symptoms return.
- Continue with abdominal massage, Gupta, castor oil packs, digestive enzymes, probiotics
- Try Elemental Heal shakes with hybrid low FODMAP diet- elemental diet shake can also support SIBO AND work on gut healing
- Begin gut healing phase with Glutagenics alternated with GI Revive, and IgGMega2000 (she is sensitive to lactose - so no colostrum), and BPC-157 (oral peptide) if needed.

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