

IBSSURE CONCEPTUAL GUIDE

IBSSure measures two blood based antibodies that can be used in the diagnostic workup of IBS, and to rule out IBD. These antibodies can also identify past exposure to bacterial toxin (food poisoning), and autoimmunity of the intestinal motility system (pacemaker). Finally, anti-CdtB antibody has been correlated with positive SIBO diagnosis in literature.

TERMS AND CONDITIONS ASSOCIATED WITH DYSMOTILITY

IBS: Irritable Bowel Syndrome is a common disorder that affects the large intestine (colon). IBS commonly causes cramping, abdominal pain, bloating, gas, diarrhea, and constipation. IBS is considered a functional condition and a definitive diagnostic biomarker is currently unknown.

IBD: Inflammatory Bowel Disease is a collective term for two conditions-Crohn's Disease and Ulcerative Colitis. These conditions are considered autoimmune in nature and are characterized by chronic inflammation of the GI tract. Prolonged chronic inflammation usually causes damage and destruction to intestinal cells. IBD is usually diagnosed by intestinal biopsy or stool culture.

Peristalsis: Wave-like smooth muscle contractions that occur in the wall of the digestive tract-beginning in the esophagus and continuing throughout the intestinal lumen, from the stomach through the small intestine. Peristalsis is active in the fed state and functions to move food through the digestive tract. The vagal nerve initially activates peristaltic contractions, but these contractions are further stimulated by stretch receptors and the enteric nervous system within the stomach and small intestine.

MMC: The Migrating Motor Complex represents a pattern of electromechanical activity in the smooth muscle of the small intestine. It serves a "housekeeping role", functioning to sweep and remove undigested residual material through the digestive tract. The MCC is activated by hormonal activity (motilin and ghrelin) and is active only in the fasted state, and is different from peristalsis. Defects in MMC are thought to be a chief player in the development of SIBO (small intestinal bacterial overgrowth).

SIBO: Small intestinal bacterial overgrowth is defined as the presence of excessive bacteria in the small intestine. Normal peristalsis and sphincter function should move ingested foods and bacteria from the upper digestive tract into the large intestine. Failure to move the bacteria along will allow them to become established and overgrow in the small intestine. Overgrowth of bacteria in the small intestine (SIBO), disturbs digestion and absorption. In addition, SIBO damages the intestinal lining and creates a state of mild to severe intestinal permeability (leaky gut syndrome). Current research suggests that 85% of IBS cases are concurrent with SIBO¹.

Intestinal Permeability and Autoimmunity: Intestinal permeability (i.e. "Leaky Gut Syndrome") is a condition where the integrity of the intestinal cell barrier is compromised/broken down. Normally, our intestinal cell network forms a very important barrier between our digestive tract (outside environment) and our blood stream (inside environment). With intestinal permeability, the barrier is broken down and intestinal contents can enter the blood stream. Intestinal permeability can be associated with a variety of symptoms and clinical manifestations including digestive, systemic, or autoimmune responses.

Anti-Cytolethal Distending Toxin B (anti-CdtB): Cytolethal distending toxin B (CdtB) is a subunit found on most bacteria that cause food poisoning (acute gastroenteritis). Post infection, the body will usually produce antibodies to CdtB. These CdtB antibodies can bind to the interstitial cells of cajal (ICC), which are essentially the "pacemaker" cells of the of the small intestine, controlling the nervous system of the intestine, the migrating motor complex, and the pacing of peristalsis. The CdtB antibodies also have molecular mimicry with the intestinal protein vinculin.

Anti-vinculin: Vinculin is a protein located within the interstitial cells of cajal (ICC). Anatomically, it binds to actin and thus is involved in cell adhesion, motility and contractility, and epithelial barrier formation. Anti-Cdtb antibodies have molecular mimicry with vinculin; they can bind and reduce vinculin gene expression and initiate an autoimmune cascade that results in the formation of vinculin antibodies. When vinculin antibodies are formed, digestive motility is impaired. Research suggests that the presence of vinculin antibodies can differentiate IBS from IBD in the workup of chronic diarrhea.

*References: ¹ <https://www.ncbi.nlm.nih.gov/pubmed/1531600>

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DIETARY PRACTICES TO SUPPORT MOTILITY

Foods and Practices to Include

1. **Functional Foods:** support intestinal healing, have prokinetic properties, and stimulate digestion
 - Bone broth: to cleanse the gut while providing nutrition
 - Ginger
 - Garlic
 - Radish (root and leaves)
 - Lemon
 - Cayenne Pepper
 - Apple cider vinegar
2. **Anti-inflammatory foods**
 - Omega-3 Fatty Acids
 - Fish and Seafood
 - Plant-based sources
 - Turmeric
 - Sulfurous vegetables
 - Deep colored fruits and vegetables high in antioxidants
3. **Adequate hydration**
4. **Intermittent fasting techniques to stimulate the MMC**
5. **Low residual fiber diet-avoid raw vegetables/fruits and other fibrous foods**

Foods and Practices to Remove

1. A food sensitivity test can help guide and prioritize an elimination diet
2. A gluten and wheat free diet is almost always indicated to protect and heal intestinal tight junctions
3. Low FODMAP diet or GAPS diet may be effective
4. Avoid alcohol and caffeine
5. Avoid excessive pesticide residues by choosing organic produce, coffee, and meats
6. Caution with all plastics, particularly BPA containing plastics that are exposed to heat

TREATMENT AND TECHNIQUES TO SUPPORT MOTILITY

Please work with your physician or health care practitioners to optimize a diet, lifestyle, and treatment plan.

- **Pharmaceuticals**
 - Prokinetic drug: to stimulate the migrating motor complex (MMC)
 - Antibiotics: to kill bacteria
- **Functional Foods**
(foods that stimulate digestion or act as prokinetics)
 - Ginger
 - Radish (root and leaves)
- **Stress management techniques and proper sleep hygiene**
- **Physical activity/exercise/daily movement**
- **Consider acupuncture and/or massage**
- **Vagal nerve exercises to stimulate peristalsis: gargling, yawning, singing**
- **Potential Supplement Approaches**
 - Prokinetic supplements to stimulate the migrating motor complex (MMC)
 - Natural antibiotics: to kill bacteria
 - Berberine
 - Grapefruit seed extract (GSE)
 - Oregano oil (liquid drops or enteric coated)
 - Peppermint oil
 - Alicin/Garlic
 - Oil pulling, to reduce overall microbial load on the body
 - Magnesium
 - Prebiotics and Probiotics are controversial during treatment. Consult with your health care provider for definitive direction.
 - Evaluate low stomach acid and potentially supplement with betaine HCL (with pepsin) if consuming a meal rich in protein. Always consult with your health care practitioner before attempting this supplement protocol.
 - Digestive Bitters
 - 5-HTP to support motility